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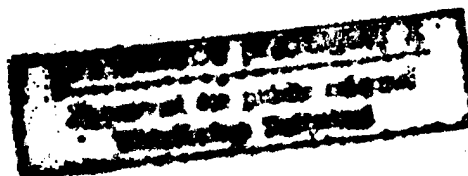
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# USSR Report

SCIENCE AND TECHNOLOGY POLICY



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6 August 1984

# USSR REPORT

## SCIENCE AND TECHNOLOGY POLICY

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## ROLE OF SCIENTIFIC SOCIETIES IN PRODUCTION DISCUSSED

Kiev EKONOMIKA SOVETSKOY UKRAINY in Russian No 1, Jan 84 pp 72-75

/Article by V. Lola, deputy chairman of the Ukrainian Council of Scientific and Technical Societies: "Intensifying the Role of the Scientific and Technical Community in an Increase in Production Efficiency"/

/Text/ The 26th CPSU Congress set the task of leading all national economic sectors to the advanced lines of science and technology, systematically pursuing a unified policy and making the transition to a mass application of highly efficient systems of machines and technological processes. The November (1982) and June (1983) Plenums of the CPSU Central Committee once again stressed that potentials for increasing the efficiency of public production should be sought in an acceleration of scientific and technical progress and in an extensive and rapid introduction of the achievements of science, technology and advanced experience into production. Scientific and technical societies take an active part in the accomplishment of these tasks. The mobilization of the creative efforts of scientists, engineers, technicians, agricultural specialists and innovative workers for the maximum possible acceleration of scientific and technical progress, introduction of scientific research results into practice and strengthening of cooperation between science and production was, is and will be the main direction in their activity.

More than 30,000 primary organizations of scientific and technical societies, which unify 2.5 million scientific workers, engineers, technicians and workmen--production innovators--now operate under the guidance of party and trade union bodies in the republic. More than 25,000 sections and committees, 2,000 scientific research institutes, laboratories and groups, 23,000 bureaus and groups for economic analysis, 19,000 councils for scientific labor organization, 20,000 technical information bureaus and 62,000 creative brigades operate on a voluntary basis within the framework of scientific and technical societies. The activity of primary organizations and their creative associations is directed by 474 oblast and 20 republic boards of sectorial societies, 25 oblast and Kiev city councils and the Ukrainian Republic Council of Scientific and Technical Societies. In the last 10 years societies have increased by 1.1 million people. The numerical growth of scientific and technical societies is accompanied by an expansion and intensification of the sphere of their activity in the planning and management of scientific and technical progress. Utilizing individual and collective forms of creative labor, members

of the republic's scientific and technical societies annually submit more than 2 million scientific-technical and organizational-economic proposals on almost all intersectorial, sectorial and regional problems and problems of the development of enterprises and associations.

The help and support of party organizations greatly contribute to the quantitative and qualitative development of the activity of scientific and technical societies. Hearing problems connected with the activity of scientific and technical societies at the meetings of party committees is one of the forms of such help. As a result of discussions qualitative, new changes in the forms and methods of work of scientific and technical societies appear and their functional role rises. In recent years oblast, city and rayon party committees have more and more enlisted scientific and technical societies in the elaboration and, what is most important, implementation of the practical measures resulting from the economic policy of the party. Scientific and technical societies widely participate in the organization and holding of scientific and technical conferences, meetings and seminars, in the discussion of the most important problems of scientific and technical progress and of the development of productive forces and in the elaboration of specific measures. For example, the Dnepropetrovsk Oblast Committee of the Communist Party of the Ukraine has enlisted scientific and technical societies in the development and introduction of an overall system of management of the quality of output and an efficient utilization of resources. Its application makes it possible to significantly increase the creative return of specialists. The Khmelnytskyi Oblast Party Committee, when developing a long-term program for an innovative and efficient utilization of labor resources, activated the creative potential of scientific and technical societies. The Nikolayev Oblast Party Committee with the participation of the council of scientific and technical societies held a discussion of the problems of development and introduction of automatic manipulators into production. The Vinnitsa City Party Committee, leaning on the activity of scientific and technical societies, profoundly analyzed the state of affairs in the area of utilization of mechanized and automated lines at all city enterprises. The results were submitted to the plenum of the city party committee for discussion.

The organization of scientific and technical public activity at the city and rayon level acquires special importance. The sectorial system of scientific and technical societies does not have coordinating bodies in these links. Therefore, it is not accidental that the primary organizations of societies search for production potentials separately and often duplicate each other. In this connection the experience in the establishment of coordinating councils of scientific and technical societies under city party committees has justified itself. The first city council of primary organizations of scientific and technical societies in the republic was established under the Berdyansk City Party Committee. It unifies the efforts of these societies in the solution of fundamental production problems on the basis of the introduction of the achievements of science and technology, helps to extend advanced production experience to city enterprises, organizes a discussion of problems connected with quality and the utilization of production potentials and provides methodological help to the organizations of scientific and technical societies in the expansion of socialist competition among engineering and

technical personnel on the basis of personal and collective creative plans. Two years ago such a council was established under the Nikopol City Party Committee. In our opinion, the establishment of such councils in all major industrial centers will make it possible to increase considerably the creative activity of the scientific and technical community. The inclusion of elective offices of chairmen and scientific secretaries of councils and boards of scientific and technical societies in the schedule of party committees would greatly contribute to the intensification of the party leadership of scientific and technical societies.

The maximum possible increase in the efficiency of the socialist competition of specialists on the basis of personal and collective creative plans, which originated during the 9th Five-Year Plan, is one of the main directions in the activity of scientific and technical societies. A total of 1.8 million specialists--members of scientific and technical societies--now work in the republic according to such plans. They annually develop and introduce more than 3 million technical and organizational measures into production. Their implementation made it possible to obtain more than 3.4 billion rubles of savings during 2½ years of the 11th Five-Year Plan--almost twice as much as during the same period of the 10th Five-Year Plan. At present competition is unfolding with the slogan "New Technology--in the Vanguard of the Five-Year Plan."

It is no secret that it is complicated to draw engineering and technical personnel and managers of services and subdivisions into competition and that here and there competition is still of a formal nature. However, in most organizations of scientific and technical societies it gives specific results and fully meets today's tasks.

In accordance with the decisions of the June (1983) Plenum of the CPSU Central Committee, Yu. V. Andropov's directives and the decisions of the April (1983) Plenum of the Central Committee of the Communist Party of the Ukraine we direct boards and councils of scientific and technical societies toward a more specific search for the potentials for the growth of output volumes and labor productivity and toward a critical approach to the evaluation of existing methods of management. In this respect the work of the primary organization of the Scientific and Technical Society at the Nikolayev Okean Ship Building Plant deserves attention. This enterprise is known all over the country for its modern large-tonnage ships. The successful construction of ore and oil carriers is primarily the result of the thoughtful search for available reserves. Plant specialists unified into creative brigades solve complex technical problems contributing to the introduction of the achievements of scientific and technical progress into production. The contact between shipbuilders and the Central Scientific Research Institute of Shipbuilding Technology (Leningrad) is especially close. The cooperation of practical workers and scientists is of considerable benefit. For example, the mastering of the method of utilizing diesel engines with the mooring of large-tonnage ships broadside on to the fitting-out quay is its result. The assembly and loading of large-size engines in two parts into engine rooms have also been introduced jointly with the workers of the Central Scientific Research Institute of Shipbuilding Technology. The annual economic effect from the introduction of the mentioned developments totals 314,000 rubles.

Glancing at their cooperation from the point of view of modern requirements, the Okean and the Central Scientific Research Institute of Shipbuilding Technology have arrived at the conclusion that it is possible to attain an even more efficient interaction. They have taken an important step in this direction. Creative brigades have been established out of practical specialists and the institute's workers at the plant for several years. They have solved more than one urgent problem for the enterprise and sector. However, the fact that only individual problems have been solved has not been satisfactory. Such a "sampling" method does not at all meet present requirements. A system, wide scope, more objective and prompt detection of bottlenecks in production and determination of the possibilities of scientists to eliminate them are necessary. All this has led to the conclusion that it is more advisable to begin the cooperation with science at the stage of formation of long-term and annual plans for the acceleration of scientific and technical progress at the plant. Recently, through the joint efforts of members of the scientific and technical societies of the plant and the institute 10 creative brigades in basic industries--shipbuilding, body finishing, assembly-welding and other brigades--have been established.

The structure of such creative associations is interesting. Every brigade is headed by the chief plant specialist or his deputy, who also are managers of the appropriate sections of the council of scientific and technical societies. From the institute managers or leading engineers of laboratories, as well as other specialists, have joined them. The statute on creative collectives clearly defines their duties, rights and responsibility. The associations are now engaged in the implementation of measures included in the oblast goal-oriented overall Progress program.

An out-of-town meeting of the Presidium of the Black Sea Interoblast Board of the Scientific and Technical Society of the Shipbuilding Industry was held at the Okean not long ago. The initiative of the primary organizations of the scientific and technical societies of the plant and the institute in the development of socialist creative cooperation was approved. It was recommended that the councils of the scientific and technical societies of enterprises support this valuable initiative. It was proposed that at the Okean creative associations be established out of practical workers and scientists at machine building and auxiliary production, as well as loading-unloading and transport-warehouse, facilities.

We shall cite another example. Not long ago the Presidium of the Ukrainian Republic Council of Scientific and Technical Societies examined the problem of "Participation of the Engineering and Technical Community of the Brovary Powder Metallurgy Plant in an Increase in Production Efficiency in the Light of the Requirements of the 26th CPSU Congress and the November (1982) Plenum of the CPSU Central Committee" at its meeting. Powder metallurgy makes it possible to significantly increase the wear resistance and durability of articles and to lower the labor and metal intensiveness of machines and mechanisms. In cooperation with scientists and specialists at the Institute of Problems of Materials Technology of the Ukrainian SSR Academy of Sciences and other scientific research and planning-design organizations in a short time without production stoppage the shop for the output of metal powders was reconstructed and fundamentally new technology was introduced there. The output of almost 600 types of parts for agricultural machines, motor vehicles and

chemical and metallurgical units was mastered at the plant. The coefficient of metal utilization reached 95 percent. A total of 2,000 tons of metal are saved and 80 metalworking machine tools and 190 workers are freed per 1,000 tons of articles produced by the powder metallurgy method. Taking all this into consideration, the meeting of the Presidium of the Ukrainian Council of Scientific and Technical Societies was held directly at the powder metallurgy plant, to where specialists from a number of industrial enterprises in the republic were invited. Adopting a decision on a meeting, we took into consideration the fact that we had something to learn from the workers of the Brovary Plant. The plant's engineering and technical community devised new industrial processes, modernized equipment and developed fundamentally new units. Production seemingly took a step toward science, which gave special value to the experience of the workers of the Brovary Plant, because such an attitude should become predominant in the activity of primary organizations of scientific and technical societies.

The invitation of specialists from other enterprises to the Brovary Plant also pursued another goal: To enable them to get more profoundly acquainted with powder metallurgy and specific technology. There is nothing complex in it. The production of parts from iron powder is essentially possible at every enterprise, especially as a plant for powder production is being built in the country. In a few years there will be enough powder for individual sectors to produce products from it for themselves. It is impossible to implement this task without enthusiasts similar to those that now work at the Brovary Plant.

During 19 years of its existence this enterprise has undergone four reconstructions, exceeding all planned figures twice. In this matter great credit belongs to the primary organization of the scientific and technical society, whose council has performed the functions of the enterprise's production and technical council for 10 years.

The Presidium of the Ukrainian Council of Scientific and Technical Societies noted in its decree: "To generalize the practical experience of the primary organization of the scientific and technical society at the Brovary Powder Metallurgy Plant. To recommend that ministries and departments organize shops and sections for the production of articles from iron powder."

Practice shows that any initiative is transformed into a real force if it reflects the fundamental and vital interests of the Soviet people and gives fruits if it is based on creativity, initiative and energy of the masses and if economic and social organizations actively promote its dissemination. Unfortunately, at times we lack such an attitude toward the new. The republic press has illuminated quite widely the experience of the Rovno Azot Production Association, where the scientific and technical community has found an interesting solution of the problem of increase in the efficiency of managerial labor. The Presidium of the Ukrainian Council of Scientific and Technical Societies has also expressed its attitude toward the experience of the workers of the Rovno Association. However, the boards of sectorial societies are indifferent toward the experience of Rovno chemists, although it is of intersectorial importance and can be easily repeated in any sector.

Under present conditions creative work in general, especially scientific and technical work, cannot develop successfully without a scientific basis, without the development of theory and methodology and without teaching workers methods and techniques of solution of various problems of improvement in production. A great deal has already been done in this direction. A Soviet theory of solution of engineering problems has been developed and is being improved constantly. Its application makes it possible to significantly intensify and optimize the labor of the engineer, scientific worker, inventor and efficiency expert and to receive solutions of technical problems at the highest level. However, scientific and technical societies do not yet fully utilize this and other scientific developments in their practical activity and timidly approach their study and dissemination.

It is necessary to stir up work on an improvement in the forms and methods of activity of societies. The lack of a state record of the recommendations and proposals of scientific and technical societies and of definite forms and a procedure of reporting on their realization has a negative effect on the work of scientific and technical societies. Unfortunately, at present by no means all ministries and departments and economic managers pay proper attention to the recommendations and proposals of the scientific and technical community.

The interaction of societies with the institutions of the Ukrainian SSR Academy of Sciences needs further improvement. The problem of the introduction of the achievements of science into practice is the main problem in the process of cooperation of the Ukrainian SSR Academy of Sciences and scientific and technical societies. It is necessary to more widely enlist the organizations of scientific and technical societies in the drawing up of scientific research plans. The earlier production workers learn about the essence of scientific development, the more time they will have for technical and technological preparation for its utilization. The process of scientific research needs an intermediary discussion of the course of work, specification of the correctness of the selected research methods and correction of initially selected goals. There is a need for a medium of exchange of information between developers and production workers. Scientific and technical societies are such a medium. Therefore, the scientific plans and investigations of scientists of the Ukrainian SSR Academy of Sciences should be regularly submitted to them for discussion. This is within the power of scientific and technical societies. They have demonstrated this more than once, when they have initiated and systematically executed contracts for creative cooperation between scientific and production collectives.

It seems advisable to establish and expand contacts (with mutual representation) between the departments of the Ukrainian SSR Academy of Sciences and the committees of the Ukrainian Council and the sections of republic boards. It would be useful to introduce into practice an annual examination of the results of scientific research and of its introduction into production at a joint meeting of the Presidium of the Ukrainian SSR Academy of Sciences and the Ukrainian Council of Scientific and Technical Societies. The popularization of scientific achievements, training of scientific personnel and improvement in the skills of scientific workers are important areas of cooperation between the Ukrainian SSR Academy of Sciences and scientific and technical

societies. The time has come to make the contacts of the organizations of scientific and technical societies and the institutions of the Ukrainian SSR Academy of Sciences closer and more constant for the purpose of accelerating scientific and technical progress.

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## INTEGRATION SEEN AS NEW FORM OF ORGANIZATION OF SOCIAL PRODUCTION

Moscow EKONOMICHESKIYE NAUKI in Russian No 2, Feb 84, pp 28-32

[Article by P. Zakaryavichyus, docent, candidate of economic sciences:  
"The Scientific-Technical Revolution and Forms of Organization of Social  
Production" under the rubric: "Economic Laws and Socialist Management"]

[Text] One of the most important factors of the development of production is social division of labor and the cooperation appropriate to it. K. Marx and F. Engel's pointed out that: "The level of development of the productive forces of a nation is readily apparent in the degree to which its division of labor is developed."<sup>1</sup> Intensification of the social division of labor promotes increasing the degree of socialization of production, which is displayed in the development of such forms of its social organization as concentration, specialization, cooperation, and combination. Scientific and technical progress has a direct influence on the process of social division and cooperation of labor, and thereby also on the development of the forms of organization of social production.

The principal changes, which the modern scientific-technical revolution is introducing to technology and to the technological processes, have an important influence on the development of the forms of organization of social production. This influence has not yet been studied sufficiently: questions of the interdependence of the types and forms of specialization of production have not been completely worked out; it is necessary to research more thoroughly certain aspects of the interrelations of the forms of concentration and the types of specialization; the capabilities of the new forms of organization of social production have not been fully revealed; etc. Therefore, research on the development of the forms of organization of social production under the conditions of the scientific-technical revolution [STR] is a matter of current interest for political economists.

The initial form of organization of production, which determines the growth of its socialization, is concentration of production. The classical works of Marxism-Leninism repeatedly stress that the constant growth of the scale of production within the limits of the primary production cell is an objective process. Karl Marx wrote that there is a general law, "which extends to all branches of modern industry, namely the law of concentration,"<sup>2</sup> which has a decisive influence on the growth of the productive forces of society. The objective prerequisite for the operation of this law is the development of science and technology and their technological use.

"...Machines lead to concentration of production..." wrote V.I. Lenin: "The introduction of machines, on the one hand demands significant amounts of capital and therefore is possible only for big businessmen; on the other hand, a machine pays for itself only when there is an enormous amount of products to manufacture; expansion of production becomes a necessity when introducing machines."<sup>3</sup> Thus, scientific and technical progress objectively brings about the necessity for the appropriate level of concentration of production and has a definite influence on the development of this process.

As is well known, the basic types of concentration of production are aggregate--increasing the manufacture of products by virtue of increases in the individual capacities of machines and mechanisms; and technological--increasing production output by means of intensification of the technological processes.

STR influences the development of aggregate concentration in two directions: first, by means of establishing principally new assemblies (machines, mechanisms, equipment, apparatus), the capacity of which greatly exceeds that of the previously-used assemblies (for example, metal-working machine tools with numerically programmed control); and secondly, by means of increasing the individual capacities of assemblies which have been in use for a relatively long period of time (for example, the capacity of steam turbines in use at the end of the 1980's, when compared with those of the early 1930's, has expanded from 50,000 to 1,200,000 kWt by virtue of the use of generator-building materials and assembled articles built on the basis of principally new technology).

The development of technological concentration is realized for the most part by means of introducing principally new technological processes. For example, in the chemical industry, in metallurgy and in a number of other branches, new technology has permitted significant increases in product output without increasing the number of enterprises or the number of production workers. The STR has an influence not only on the development of the meaningful side of the basic types of concentration of social production, but also on its rates: replacing equipment or technological processes with principally new types permits significantly increasing product output in a relatively short period of time.

The STR also has an effect on the economical and organizational form of concentration of production. This effect is realized not by means of a direct influence on the equipment, but by means of interaction of the equipment with the other elements of the productive forces.

Until recently the basic form of concentration of production under socialism was plant concentration, that is, increasing the output of a certain kind of product at an enterprise (plant, factory). It was implemented in two ways: on the basis of aggregate and technological concentration; and by creating new shops and manufactures and bringing in new workers. Analysis indicates that there was a greater tendency toward development of the aggregate and technological forms of plant concentration, in proportion to accelerated scientific-technical progress and increases in creation and introduction of new equipment and technological processes.

Plant concentration, both aggregate and technological, is the concentration of production of specialized products, inasmuch as optimal use of powerful equipment and highly-effective technological processes is possible only when there is the required volume of homogeneous production to be manufactured with their help. Consequently, the STR has a direct effect on the development of the plant form of concentration of production on the basis of its specialization. The functioning of a great enterprise as a single entity permits solving questions of the social development of the collective on a higher plane, and better use of all kinds of resources. However, from the position of the national economy as a whole, bringing enterprises to the optimum size from the point of view of equipment utilization, is not always possible for many branches of industry for a wide variety of reasons; such, for example, as the increase in transportation expenses connected with increasing the distances between the producers and the consumers of the products, the lack of the required amount of labor resources, and others. Moreover, bringing all functioning plants and factories up to the optimum size does not always coincide with the needs of society for one product or another. All of this testifies to the fact that there are definite limits to the development of the plant form of concentration of production, and that it is necessary to utilize other economical and organizational forms. At the modern stage, one of these is systemic centralization of production — by means of establishing production associations. Concentration of production within their framework takes place by means of an association of several enterprises which produce products of the same type. As a result, internal specialization of production becomes more intense: the enterprises which had previously produced a finished product now become large specialized shops, producing a definite range of units and components, the assembly of which is also concentrated in one of the subsidiary enterprises. Thereby the optimum size of the production association is achieved, and within it there are subsidiary enterprises which produce completed units and components for the end product.

Concentration of production, while promoting the growth of its socialization, also promotes intensification of the social division of labor, and further development of specialized production. One should note, that concentration of production to a significant degree is accomplished on the basis of its specialization; that is, it is concentrated basically in specialized production.

As is well-known, in the social division of labor, Karl Marx singled out the general—the division of social production into major types (agriculture, industry, etc.); the particular—the breakdown of types of production into categories and sub-categories; and the individual—the division of labor within a workshop.<sup>4</sup>

The result of the development of the particular division of labor, in industry for example, is specialization of its branches<sup>5</sup>, specialization of its enterprises (plant specialization) and intra-plant specialization. Modern manufacturing associations represent a variety of plant specializations. And specialization within an association has features of both plant and intra-plant specialization.

The basic forms of specialization in industry are: item production, production operations, or specialization in output of the end product; component production, when the production realized consists of subassemblies and components; and technological, when technologically homogeneous products are manufactured.

The modern STR has an especially strong influence on the development of technological specialization. Specifically, this is manifested in the fact that on the basis of a number of technological processes products are manufactured which according to the established specialization belong to various branches. This entails the necessity for branch reorganization, development of inter-branch production and so on. The STR also has an influence on the interaction between categories and forms of specialization. Whereas earlier plant specialization, not to mention branch specialization, was developed on the whole on the basis of the item form, now at the modern stage not only the plants but also certain branches are specializing in the output of subassemblies and components and not the finished product.

One of the complex problems associated with the influence of the STR on the development of industrial specialization is the establishment of optimum limits (depths) of the latter. Experience shows that the development of specialization can be unlimited not only on the basis of individual division of labor—within the enterprise (association), but also at the level of the enterprise, that is, on the basis of a particular division of labor. However, specialization at the level of an enterprise (association) does not always result in increased effectiveness of social production.

The result of industrial specialization is cooperation, the basis for which is long-term production ties among the specialized enterprises, associations and branches which jointly manufacture a particular product. Two types of cooperation are distinguished: limited cooperation, connected with specialization, and one which represents a form of mutual assistance among enterprises. In the first instance production ties are based on deliveries of components and subassemblies from the subcontractor to the enterprise which produces the end product. In the second, they are based on the capability of one enterprise to manufacture some kind of components and subassemblies, which are not its basic product, and to deliver them to others. Intensification of industrial specialization promotes the development of inter-branch production, which produces products for a variety of purposes.

Specialization and as a consequence, cooperation in production, are developed on the basis of intensifying the social division of labor, conditioned by the process of differentiation of technology. In modern conditions this process is at one with the integration of various directions in technology. This signifies that principally new mechanisms, equipment, apparatus, and technology can be created by means of organic combination of several directions of previously isolated technology into a single production process. The result of this process is a principally new integrated article.

One example of technology integration, and the creation on this basis of new articles is found in the development of electronics and radio technology. Prior to the appearance of the latest generation of electronic elements—microcircuits—electronic technology and radio technology, although closely associated, were developing in parallel; various radio instruments were assembled from the very same electronic elements. With the appearance of microcircuits, it has been necessary to develop specific microcircuitry for practically every article of radio equipment, although their principles of operation are identical. Consequently, development of radio equipment of the latest generation and development of the elements on which it is based should be accomplished in an integrated manner. At the same time the development of the element basis is somehow becoming "individualized", and specific microcircuits are being created for each kind of article. This suggests the need for uniting the developers into a single integrated collective. As a result, a new form of organization of social production arises—integration. It is an organic amalgamation in a unified production-operations system of previously specialized social production subsidiaries (enterprises, associations and even branches).

Certain authors suggest that integration of production is not a form of organization, but a definite process, "not an item and not even a state, but an action, the dynamic of the state of an object."<sup>6</sup> They consider cooperation in all its categories to be the result and the sum total of the integrational process in an organizational respect. In our opinion this is not entirely correct. Ensuring the realization of profound integrational processes is not possible by means of summing up the results of separate stages of the division of labor, which presupposes specialization and cooperation, but by means of forming a unified organism, which combines divided labor into cooperative labor until the appearance of some kind of intermediate results of a finished character at certain of its stages. We agree with O.G. Belous, who writes that integration of production is a form of its organization and at the modern stage of its socialization it should occupy its rightful place along with such forms as specialization, concentration, cooperation and combination.<sup>7</sup>

The opinion is held, that modern branch industrial associations represent such a form of organization of social production as integration. Such an opinion is based on the fact that in these associations questions of specialization and plant concentration are being solved in a principally new manner, which organically coordinates all production units, and creates an effective production-operations system. In our view, this position is not justified. Indisputably, within the production associations a higher level of intra-firm specialization and cooperation is achieved, and conditions are created for optimization of the industrial structure. However, the products manufactured by the association can be produced on the basis of inter-plant or even inter-branch cooperation. But integrated articles cannot be created if the production units designed for manufacturing their separate elements are not organically united.

Production integration does not conflict with specialization and cooperation. The articles produced on this basis are the specialized production--and the production-operations unit which produced them is also specialized. The production associations themselves represent a form of enterprise on the basis of which production integration can be developed.

The STR has an influence on the development of such a form of production organization as combining production. As is well known, this entails combining in a single enterprise the manufacturing of products which relate to various branches, and is characterized by combining successive stages of processing of the product, integrated utilization of raw materials, and use of the by-products of production. New opportunities for the development of combining production are being opened in connection with the development of so-called waste-free technology, which not only promotes more effective use of raw materials and supplies, but also permits vast improvements in solving problems of protecting the environment.

Thus, under the influence of the STR, on the one hand there are significant changes in the substance of such forms of organization of social production as concentration, specialization, cooperation and combination; and on the other hand, a new form appears--integration. These processes are promoting the further development of socialization of socialist production and must be considered when working out measures for improving the economic mechanism, the branch and the production structure of the national economy.

The direction of this improvement, as was noted in the speech of Comrade Yu.V. Andropov at the December (1983) CPSU Central Committee Plenum, is determined by the fact that: "...We must be constantly and steadily concerned with accelerating scientific-technical progress. Many branches of industry are presently forging ahead rapidly and confidently in this decisive direction... However, the organization of the entire complex of scientific-technical work is still far from completion. In a number of branches they are simply marking time, and are not fulfilling the plans for new technology; and one could still hope for greater breadth for such plans. The state of affairs in the national economy requires a decisive change in the ministries, departments, and USSR Academy of Sciences toward increasing the level of industrial technology and the quality of production."<sup>8</sup>

In order to implement these tasks, in our opinion it is necessary, specifically, that the branches organize as unified complexes which support the development and production of integrated articles, including the corresponding categories of integrated technology; and the production associations within the branches should support the realization of the integration processes. Such an approach is the prerequisite for the formation of branches of a new type--integrated branches.

#### FOOTNOTES

1. K. Marx, F. Engel's, "Sochineniya" [Works], 2nd Ed., Vol 3, p 20.
2. Ibid., Vol 12, p 194.

3. V.I. Lenin, "Polnoye Sobraniye Sochineniy" [Complete Works], Vol 3, pp 225-226.
4. See: K. Marx, F. Engel's, "Sochineniya" [Works], 2nd Ed., Vol 23, p 363.
5. V.I. Lenin wrote that this process is an endless process, "which separates the various categories of processing of products from one another, while establishing an ever greater number of branches of industry..." (V.I. Lenin, op. cit., pp 22-23).
6. Yu.A. Lavrov, F.M. Rusinov, and V.I. Chumakov, "Integratsiya sotsialisticheskogo proizvodstva i upravleniya" [Integration of Socialist Production and Management], Moscow, 1976, p 23.
7. See: O.G. Belous, "Problemy obshchestvennoy organizatsii promyshlennogo proizvodstva" [Problems of Social Organization of Industrial Production], Kiev, 1979, p 36.
8. PRAVDA, 27 December 1983, p 1.

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## ACCELERATION OF SCIENTIFIC PROGRESS IN KAZAKHSTAN URGED

Alma-Ata NARODNOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 11, Nov 83 pp 3-8

/Article: "To Accelerate Scientific and Technical Progress"

/Text/ In its economic policy our party pays the greatest attention to problems of acceleration of scientific and technical progress. It proceeds from the fact that the establishment of the material and technical base of communism is inconceivable without advanced science and technology.

V. I. Lenin repeatedly stressed that socialism required equipment built according to the last word in latest technology ("PSS" /Complete Works/, Vol 36, p-300). In the combination of advanced science and technology with the political advantages of the new socialist system he saw the vitality and historical invincibility of socialism.

"No dark force can stand up against the alliance of the representatives of science, the proletariat and technology," V. I. Lenin wrote (Ibid, Vol 40, p 189).

Owing to the systematic introduction of the achievements of scientific and technical progress our country has reached the advanced lines of progress during a historically short period. The acceleration of scientific and technical progress is the main lever, which, when undertaking it, it is possible to raise our entire economy to a qualitatively new level, to ensure high rates and an intensive nature of its development and thereby to make even more significant advances in the rise in the well-being of the Soviet people. The fact that almost three-fourths of the increase in labor productivity in the national economy is ensured by a rise in the technical level of production and the remaining part depends on an improvement in the organization of production and labor and on other factors points to the importance of scientific and technical progress.

"The party organically connects the turn to efficiency and quality with work on improvement in production on the basis of modern science and technology," it was noted at the 26th CPSU Congress. The task of accelerating the retooling of production and of pursuing a policy of the most rapid development and general introduction of fundamentally new equipment and materials and of a large-scale use of highly productive energy and material saving technology is set during the 11th Five-Year Plan. The rates of equipment replacement will be accelerated approximately 1.5-fold." The increased social and economic

urgency of utilization of the achievements of scientific and technical progress is due both to the high rates of replacement of means of labor and industrial output and to the predominant share of the direct participation of scientific and technical progress in an increase in the national income. Penetrating into all the spheres of human activity, scientific and technical progress is transformed into the main moving force of the intensification, improvement in the structure and increase in the efficiency of production. It has been estimated that the realization of scientific achievements ensures about 75 percent of the increase in labor productivity, more than 50 percent of the increase in the national income and approximately one-half of the decrease in the production costs of industrial products.

Speaking at the June (1983) Plenum of the CPSU Central Committee, Comrade Yu. V. Andropov, general secretary of the CPSU Central Committee, stressed the following: "A unified scientific and technical policy now acquires decisive importance. Vast work on the development of machines, mechanisms and technologies both for today and tomorrow awaits us."

The recent decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures For Accelerating Scientific and Technical Progress in the National Economy" has become an important step on the path of realization of the decisions of the 26th party congress and of the November (1982) and June (1983) plenums of the CPSU Central Committee on a fundamental increase in labor productivity on the basis of an extensive and accelerated introduction of the achievements of science, technology and advanced experience into practice.

"To develop a system of organizational, economic and moral measures, which would interest managers, workers and, of course, scientists and designers in the replacement of equipment and would make work according to old methods disadvantageous," Comrade Yu. V. Andropov noted at the June Plenum of the CPSU Central Committee, "this is the task." This decree is aimed at its accomplishment. A specific program of actions for a sharp acceleration of the rates of scientific and technical progress in the country has been approved.

It has been established that the fulfillment of plans and assignments for the development of science and technology is included in the most important indicators, according to which an evaluation of the results of the economic activity of associations and enterprises is made primarily, as well as the results of socialist competition are reviewed. Directors of ministries and departments will have to accomplish responsible tasks for the scientific and technical retooling of production and a fuller satisfaction of the demand for high-quality products.

New opportunities for the further development of scientific and technical progress also open up before Kazakhstan. Occupying an important place in the all-Union division of labor, the republic has its own character and technical and economic direction. Industrial sectors reflecting modern scientific and technical progress have been formed here. Kazakhstan's economy is developing in a dynamic way and at high rates. The advances in technical development are also considerable.

The fact that overall programs for the solution of important scientific and technical problems were first drawn up and implemented during the past five-year plan is a vivid expression of the profound processes occurring in the area of development of the republic's science and technology.

The 25th Congress of the Communist Party of Kazakhstan, which determined the prospects for the republic's economic development during the 11th Five-Year Plan, set specific tasks in the area of scientific and technical progress and on this basis an increase in the efficiency of public production.

In industry this is the development and introduction of advanced technology and improvement in the quality of machines, machine tools and consumer goods.

Builders must raise the level of industrialization and mechanization of operations, improve the quality of output, reduce the material intensiveness of buildings and develop highly efficient, new building materials.

The development of highly productive varieties and the maximum possible mechanization and automation of labor—the efforts of agricultural workers and scientists are directed toward this. Tasks for the implementation of a set of measures connected with the mechanization and automation of engineering-managerial labor have been set.

Since the beginning of the five-year plan a great deal has been done to fulfill the tasks set by the party. In the republic 10 goal-oriented overall scientific and technical programs have been developed and are being realized and a list of preliminary drafts of seven goal-oriented overall national economic and social programs for 1986-1990 and for the period until the year 2000 has been approved. Goal-oriented programs for the solution of major scientific and technical problems in industry, agriculture, the nonproductive sphere, transport and road construction have been worked out and are being implemented by ministries and departments. All of them have been approved by the republic's State Planning Committee and included in the state plan for economic and social development. Ensuring a more rapid introduction of scientific research and technical developments into production is the goal of such programs. Measures for a rise in the technical level of production and output on the basis of the introduction of advanced technological processes and highly productive equipment and the retooling of enterprises are implemented in all the sectors of the republic's national economy. Since the beginning of the five-year plan 600 mechanized, overallly mechanized, flow and automatic lines and 13,185 units of highly productive equipment have been introduced and 435 shops, sections and enterprises have been mechanized and mechanized overallly.

The management of sectors, enterprises and large production facilities is being improved on the basis of an extensive introduction of automated systems of management and computer complexes.

The achievements of science and technology are widely applied in industrial enterprises, construction organizations and agricultural production. The volumes of introduction of the ore extraction system with the use of highly productive sets of self-propelled equipment in underground mining operations have expanded significantly.

For example, 10 drilling rigs and 29 loading machines with units of increased strength were introduced at the Dzhezkazgan Mining and Metallurgical Combine last year. The use of modernized types of machines made it possible to obtain an economic effect of 422,000 rubles. As compared with ordinary technology the ore extraction system with the use of self-propelled equipment made it possible to more than double labor productivity and to improve the working conditions at work places. Operations connected with the development of the technology and techniques of extraction and with the concentration of minerals are performed according to a goal-oriented overall program.

On the basis of the introduction of advanced technological processes, efficient building materials, machinery, equipment and advanced methods of labor the level of industrialization of construction rises. For example, the proportion of completely prefabricated construction in the republic's Ministry of Construction of Heavy Industry Enterprises now comprises 78.2 percent. According to the developments of goal-oriented overall programs the republic's Ministry of Construction of Heavy Industry Enterprises and the Ministry of Rural Construction have introduced fundamentally new technologies of the installation of foundations on sagging grounds in rammed trenches and of paper roofs by the mechanized method with the use of built-up ruberoid.

The technology of a combined process of mercerization and scouring of cotton fabrics, the process of production of wool yarn with pneumatic spinning machines and the highly productive Tekstima combing machine are used in light industry for the first time. According to various plan types more than 120 advanced technological processes have been introduced and mastered in this sector of industry, including 30, for the first time this year.

Ten new technological processes of production of various agricultural products developed according to the assignments of goal-oriented overall programs have been applied in agriculture for the first time.

In the republic there are many examples of skillful and purposeful work by collectives on the acceleration of scientific and technical progress. The fight for the retooling of the enterprise and for an increase in labor productivity has become one of the main directions in the activity of the managers and specialists of the Alma-Ata Heavy Machine Building Plant. Scientific and technical progress is carried out here in two directions:

- 1) Improvement in the internal production base and a rise in the technical level of production.
- 2) Improvement in output and the development of models of new equipment.

Fulfilling the first task, plant workers try to improve the planning and management of production, to introduce advanced technology, to carry out overall mechanization and automation and to master modern methods of production organization. The second direction sets as its goal the realization of scientific and technical ideas in the development of models of new equipment and its introduction into production on a large scale and the output of qualitatively new machine tools meeting the best domestic standards.

The plant manifests much concern for an increase in production efficiency and for a better utilization of potentials. The introduction of new technological processes is preceded by their profound study and the efficiency and advisability of every measure. Since the beginning of the year the economic effect from the introduction of advanced technology has totaled 70,000 rubles.

The Grekhovskiy Mine of the Zyryanovsk Lead Combine has become an example of the introduction of modern machines. The use of highly productive self-propelled equipment in mining operations made it possible to raise labor productivity fourfold during the years of the past five-year plan. During this five-year plan it will rise to the preset volumes, which will make it possible to obtain an economic effect of 1.8 million rubles.

The experience of the Ust-Kamenogorsk Lead and Zinc Combine deserves attention. Efficient creative relations with many scientific institutions have been established here and the competition for shortening the periods of introduction of the achievements of science and technology into production and for increasing on this basis the capacities for the output of highest-quality products has been expanded.

The scope and national economic significance of the performed scientific research increase in the republic year after year. The subdivisions of the Kazakh SSR Academy of Sciences now operate in most large oblast centers, which contributes to bringing science closer to the specific needs and requirements of the national economy. The party and the government have created the most favorable conditions for the development of scientific research and the most rapid introduction of the achievements of science and technology. The scientific potential has grown immeasurably. More than 36,000 scientific workers work in the republic. Research is now conducted in 33 scientific research institutes and affiliates, as well as in problem laboratories. The relations between science and production develop successfully at departments of higher educational institutions. Every year the scientists of the Kazakh SSR Academy of Sciences introduce more than 100 investigations into practice and receive up to 400 certificates of invention. The role of scientific research, planning-design and technological institutes of ministries in the acceleration of scientific and technical progress has risen appreciably.

Scientific production associations, within the framework of which scientific research is conducted, experimental design developments are carried out and the industrial output of new articles is organized, have become the most advanced and efficient forms of strengthening the relations of science with production. Today there are six scientific production associations in the republic.

The advances made in the utilization of the achievements of science and technology would have been more substantial if all ministries, departments and enterprises had handled this matter with sufficient responsibility.

Comrade D. A. Kunayev, member of the Politburo of the CPSU Central Committee, first secretary of the Central Committee of the republic, said the following at the 25th Congress of the Communist Party of Kazakhstan:

"At the same time, it is time for everyone to understand that without a persistent introduction of the achievements of scientific and technical progress we will always be the losers. The era of the scientific and technical revolution authoritatively dictates its laws and those that try to ignore them impede the economy and prevent the combination of the advantages of the socialist system of management with the scientific and technical revolution."

In this connection directors of the ministries of nonferrous metallurgy, the construction materials industry, the meat and dairy industry and construction of heavy industry enterprises were subjected to sharp criticism at the congress. Unfortunately, today it must be stated that the situation in these ministries has not changed for the better. They continue to constantly disrupt the fulfillment of the assignments for the development of science and technology.

For example, last year the enterprises of the Ministry of the Construction Materials Industry did not fulfill 5 out of 19 planned assignments in a full volume. Out of 38 assignments for the introduction of advanced technology and the mastering of new types of industrial products the republic's Ministry of Construction of Heavy Industry Enterprises did not cope with the fulfillment of 11 assignments.

Many ministries and departments in the republic do not fully ensure the loading of the capacities of existing mechanized, flow, overallly mechanized and automatic lines and of other highly productive equipment. The weak organization of control and the decline in the responsibility of managers of the services of the central apparatus of ministries and departments and of the enterprises and organizations subordinate to them for this most important matter are the main reasons for the nonfulfillment of the assignments for the development of science and technology. Furthermore, plans for technical progress often are worked out without the proper substantiation and calculations and without provision with the necessary financial, material and labor resources. The scientific and technical level of many enterprises is not at the proper level. The overall mechanization of auxiliary and subsidiary operations remains an acute intersectorial problem. Although this link is not the basic in importance, but the main in labor intensiveness, in the technological cycle, it remains the biggest "bottleneck" on the scale of the entire national economy. The share of manual labor in these operations is growing. In connection with this the mechanization and automation of manual labor now become the main source for an expansion of production and for a significant redistribution of labor resources in the nonproductive sphere in the future.

The decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures For Accelerating Scientific and Technical Progress in the National Economy" is a new stage in the implementation of the party's scientific and technical policy. This major party document places high requirements on the activity of economic managers for the acceleration of scientific and technical progress and for the fulfillment of plans and assignments for the development of science and technology.

Technical progress cannot be considered a mechanical replacement of old equipment and technological processes with new ones. Beginning with technical improvements in implements of labor, technical progress encompasses the entire system of management, organization and economic planning of production. All these problems should be solved overally.

The requirements on the quality of planning are increasing immeasurably. Overall nature envisaging the consideration of all the links of the complex mutually dependent science-technology-production system, as well as of the conditions determining its efficiency, becomes its main feature. As practice shows, there is a need for an organic combination of production plans with the plans for the introduction of new technology.

Planning, ensuring the continuity and overall nature of the technical development of the national economy according to a unified technical policy, will be more fruitful if it is based on a long-term forecast of scientific and technical progress.

The acceleration of the realization of scientific ideas in production and their embodiment in new types of products are the top-priority tasks in the matter of increase in the efficiency of public production. It is necessary to even more strengthen the relations of scientific institutions with industrial and agricultural enterprises and to shorten the periods of introduction of developments into production.

Together with collectives of industrial enterprises scientists must develop highly productive, new technological processes, create new structural materials and articles and search for ways of improving the quality and reliability of machine tools and machines.

The need for the coordinated work of scientific institutions, enterprises and organizations located in one industrial center, but belonging to various sectorial ministries, increases under present conditions. The combination of joint efforts will help to better solve sectorial, regional and national economic problems.

The solution of problems of scientific and technical progress largely depends on an efficient utilization of the labor and knowledge of engineering and technical personnel and on how their creative efforts are directed toward the search for internal production reserves. It is necessary to activate their participation in the solution of problems of the retooling and reconstruction of enterprises.

Big and complex tasks connected with the acceleration of scientific and technical progress are to be accomplished in agriculture. Here it is necessary to direct efforts toward the retooling of all its sectors, to widely introduce mechanization, chemicalization and land reclamation and on this basis to attain an increase in the efficiency of agricultural production. The level of mechanization of a number of construction operations, which still remains low in our republic, must be raised. In construction we must strive for a decrease in the gap between the level of mechanization of various types

of operations, especially general construction and finishing ones. The detachment of more than 53,000 innovators and inventors in the republic is called upon to make a significant contribution to the acceleration of scientific and technical progress. It is necessary to expand their initiative, to do everything that is necessary for the development of an atmosphere of creativity, to actively maintain an innovative search and to introduce all innovations into production more rapidly.

Improvement in scientific and technical information is a mandatory condition for a successful development of scientific and technical progress. The main task of the workers of scientific and technical information services is to contribute to the most rapid introduction of technical innovations into production.

The modern scientific and technical revolution is a vast force, which must be truly mastered and which must solve a problem of historical importance, that is, to organically combine the achievements of the scientific and technical revolution with the advantages of the socialist economic system. A decisive acceleration of scientific and technical progress is of great political, economic and social importance. Stressing the dialectical unity of scientific and technical progress and the economy, V. I. Lenin pointed out that the "economist should always look ahead, in the direction of technological progress, otherwise he will lag immediately..." (Lenin, "PSS," Vol 5, pp 137-138).

The decree of the CPSU Central Committee and the USSR Council of Ministers "On Measures for Accelerating Scientific and Technical Progress in the National Economy" gives new scope to the fight for scientific and technical progress and sets responsible and large-scale tasks for us.

"If we really want to advance the cause of introduction of new technology and new methods of labor," Comrade Yu. V. Andropov said at the November (1982) Plenum of the CPSU Central Committee, "central economic bodies, the Academy of Sciences, the State Committee for Science and Technology and ministries must not merely popularize them, but uncover and eliminate specific difficulties, which hamper scientific and technical progress. Planning methods and the material incentive system should promote the combination of science and production."

The duty of every collective, worker, employee, scientist and economic manager is to do everything to fulfill party requirements and to actively fight for high rates of scientific and technical progress.

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INTERNATIONAL CENTER OF SCIENTIFIC TECHNICAL INFORMATION COMMEMORATES 15TH YEAR

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 2,  
Feb 84 pp 58-63

[Interview of Prof Leonid Nikolayevich Sumarokov, doctor of technical sciences, director of International Center of Scientific-Technical Information, by chief editorial board of EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV: "15 Years of MTsNTI [International Center of Scientific-Technical Information]"; date and place not specified]

[Text] this year will mark 15 years since the formation of the International Center of Scientific and Technical Information. The chief editorial board asked Professor Leonid Nikolayevich, doctor of technical sciences, director of MTsNTI, to answer a number of questions.

[Question] What is the story of the creation of the International Center and what basic objectives were set before MTsNTI at the initial stage of its existence?

[Answer] On 27 February 1969, at the suggestion of the socialist countries, an international Agreement between Bulgaria, Hungary, the GDR, Mongolia, Poland, Romania, the USSR and Czechoslovakia was concluded, in accordance with which an International Center of Scientific and Technical Information was established. In 1973, the Republic of Cuba and in 1979, the Socialist Republic of Vietnam became members.

The creation of MTsNTI marked the beginning of a new stage of cooperation of CEMA member countries in the field of scientific-technical information. Due to its formation and also to the acquisition of experience by the national organs of information by this time, conditions were created for the organization of an International System of Scientific and Technical Information (MSNTI) for the CEMA member countries. Its work contributed to the effective solution of national-economic problems by the countries participating in it through very fast and wide-scale use of world achievements of science and technology. At the 25th meeting of the CEMA, which adopted in 1971 the Complex Program, the usefulness of creating the International System of Scientific and Technical Information was confirmed and the principles of its structure were confirmed.

The basis for the Center's whole work is to be found in pertinent decisions and documents adopted by the Council's Session, the CEMA Executive Committee and the CEMA Committee for Scientific-Technical Cooperation. Its supervisory organ is the Committee of Authorized Representatives appointed by MTsNTI member countries.

In speaking of the work directions of the International Centers in past years, there should be distinguished three chief directions: scientific-methodological support of the International System of Scientific and Technical Information, reference-information services for users and scientific-research and planning work.

The main task set by the Complex Program for the information organs of the countries of the socialist community and MTsNTI was creation of an International System of Scientific and Technical Information on the basis of cooperation of national systems, creation of international specialized (according to types of documents) and sectorial information subsystems. The basic purpose was to raise the level of satisfaction of the information needs of specialists of participating countries. Its attainment is effected by provision of effectiveness and completeness of access of the participating countries to world holdings of documents and data; reduction of outlays for acquisition and processing of information through the exclusion of unwarranted duplication at all stages of the information process; raising of the overall effectiveness of information work as the result of division of labor relating to processing by the participating countries of their scientific-technical literature and other document sources of information.

At the present time, 7 international specialized information systems (MSIS for short) and 22 international sectorial systems of scientific and technical systems (we call them MOSNTI for short) function within the framework of the International System of Scientific and Technical Information. National information systems participate in them through selected information organs (at the present time, these numbers 268). They carry out broad information servicing of users in their countries through the services of the International System of Scientific and Technical Information.

The specialized systems (for scientific-research work, published documents, industrial catalogues, patents, scientific and technical translations, scientific-technical motion-picture films and for registration of serial publications of CEMA member countries) function as systems of documentary processing of information and materials basically prepared for further processing in sectorial systems and serving users of information on documents of a certain type for the whole subject matter of MSNTI.

Sectorial systems offer complex information services for users in practically all fields of the national economies of CEMA member countries for selected subjects and primarily utilize information products obtained from specialized systems.

[Question] What does scientific-methodological support of MSNTI provide? How is it done?

[Answer] MSNTI has no analogs in world practice in terms of broadness of thematic scope and number of participating organizations. Therefore many questions relating to the creation, functioning and development of systems had to be and still have to be solved for the first time. Among them mention may be made of determination of the makeup and forms of the products put out by MSIS and MOSNTI, creation of a complex of information-search languages, development and introduction of standardized forms of international exchange of information on microstorage devices and magnetic tapes, development of a MSNTI rubricator [list of classification headings] and other solutions ensuring data, language and technical compatibility required for interoperation of MSNTI organs and subsystems. I would like to single out here the development of a complex of documents determining the structure of MSNTI and basic directions of its development. This also means such fundamental documents as "Plan of MSNTI," "Long-Term Program of Development of MSNTI During 1976-1985," "A Forecast of Development of MSNTI to 1990." The CEMA standards developed along the line of the Intergovernmental Commission for Cooperation of Socialist Countries in the Field of Computer Technology and the microfilming work group of the CEMA Permanent Commission for Cooperation in the Field of Standardization are also of major importance here.

The actual work of MTsNTI on coordinating the work of MSNTI subsystems consists of examination and expert evaluation of planning, technical, organizational and other materials prepared in MSNTI subsystems, analysis of the operation and generalization of the work experience of the subsystems. The Center holds coordinating conferences for representatives of the subsystems and also consultations on different questions of information work, providing general observation and assistance in the development of MSNTI.

One other aspect of our work is very important: the Center is a school for raising the qualifications of information personnel of CEMA member countries. In the 15 years of its operation, it has trained highly skilled specialists in scientific and technical information; hundreds of colleagues of organizations of MTsNTI member countries underwent probationary training and took part in international seminars and symposiums organized by the Center.

A special place in MTsNTI work is occupied by the implementation of cooperation programs with information organs of the Socialist Republic of Vietnam, the Republic of Cuba and the Mongolian People's Republic. It is effected in the development of general agreements on cooperation of interested CEMA countries in the accelerated development of science and technology of Vietnam, the Republic of Cuba and Mongolia. Since 1981, work has been conducted on the basis of programs planned for 1981-1985. Naturally the main thing here is the development of the information potential of these countries, turning over to them experience in the field of modern information technology and training of national cadres.

[Question] Would you describe the information services of MTsNTI.

[Answer] MTsNTI conducts a service for users of the international System of Scientific and Technical Information in regard to scientific-technical problems determined by national-economic developmental programs and long-term goal-oriented cooperation programs of CEMA member countries. It is

It is carried out on the basis of a complex information data base of the Center of the International Specialized Information System for Scientific-Research Work and Related Profile Publications.

MTsNTI provides information services through wide-scale use of the scientific information potential of the CEMA member countries. Here it is necessary to point out that a significant volume of research and development in the field of science and technology and the need of effective and coordinated development of the complex of science--technology--production--sale have been responsible for the adoption of new principles of organization of information machine-read large-volume arrays and particularly the creation of complex information bases and the introduction of the most advanced information technology for their processing.

These bases include polythematic and thematic oriented data bases containing information on journal publications, books, materials of conferences, dissertations and reports on problems of mechanics, physics, biology, power engineering, machine building, computer technology and operation. In order to better understand the scale of this work, we shall point out that the annual growth of the machine-read array of descriptions of documents consists of several hundred thousand entries.

It is necessary to especially emphasize that work on the basis of complex information data base is conducted in close contact with the coordinating organizations of individual national economic and scientific-technical programs or multilateral cooperation programs.

I would like to refer to the basic profile publications put out by MTsNTI. These consist of the analytical problem-oriented collections "Achievements and Prospects" for the thematic series "Power Engineering. Fuel," "Natural Resources and the Environment," "Foodstuffs and Agriculture," "Management and Scientific-Technical Progress," "Regional Systems"; the collection "Machine Building" on problems of long-term goal-oriented cooperation programs in the field of machine building; special issues of collections on the more important problems of the NTS [Scientific-Technical Council (?)], for example, "Problems of Computer Technology," "Problems of Space Research" and others; the abstract collection "Problems of Economic and Scientific-Technical Cooperation of CEMA Member Countries."

All these publications are prepared together with authoritative scientific organizations of CEMA member countries, central information organs of MTsNTI member countries and with the broad participation of pertinent MSNTI subsystems.

An important place in the work of the Center is occupied by services within the framework of the International Specialized Information System for Scientific-Research Work. This system's data base includes information on completed reports, completed scientific-research work, defended dissertations for academic degrees, scientific-technical surveys, packets of applied programs for electronic computers, licenses offered for sale in CEMA member countries.

All technological processes of the system are automated. We have designed and put into operation an integral automated information system, which is

based on the use of a packet of the expanded programs AIDOS, EVM YeS-1055M and the photocomposing [fotonabornaya] machine DIGISET-50T1.

MTsNTI also provides users with a whole collection of services offered by the MSNTI project for specialized information systems.

Services dealing with questions of theory and practice of information systems are primarily performed by MTsNTI through the periodic issue of a number of continuing publications primarily aimed at personnel of information organs and services of CEMA member countries developing and operating information systems. Among them mention should be made of the collection of "Problems of Information Systems." The series "Methodological Materials and Documents Based on Packets of Applied Programs" enjoys deserved renown. They present the work results of MTsNTI and other organizations of CEMA member countries on the development and utilization of program resources of automated systems for processing of scientific and technical information.

[Question] How do scientific-research and planning work conducted at the Center contribute to the improvement of international system of scientific information of CEMA member countries?

[Answer] I would like to emphasize here that MTsNTI scientific-research and planning work is characterized by a practical direction in the solution of basic tasks connected with the work organization of the International System, by MTsNTI's own developments and utilization of advanced experience in the field of information technology and improvement of the system of information products and services.

The basic content of this direction consists of building integrated information systems on the basis of a single electronic-computer system and standard packets of applied programs (we use the acronym PPP); development and utilization of promising packets of applied programs; development and introduction into information practice of modern technical aids as well as methods of automating information processes, including teleprocessing and creation of a network of information centers.

I have already mentioned that an integrated information system has been developed and is being used. Standard planning documentation has been prepared on its basis, and it has been turned over for adoption by several tens of organizations. This was the first information system to be realized in CEMA member countries that solved in the complex problems of automated input of information, semantic indexing [smyslovaya indeksirovaniya], information retrieval and production of abstract collections.

Work is being done at MTsNTI on the creation and adaptation of standard packets of applied programs, making it possible to complete the whole complex of problems relating to processing of large information arrays in machine-read form. The applied-program packets developed and worked up to the present time make it possible to build wide-range information systems and to utilize single electronic-computer systems of different configuration. I would like to point out that the program packets developed by MTsNTI correspond to the world level in functional possibilities and technical characteristics.

A great deal of attention is also being given to work connected with the development and introduction of new ways and methods of automating information processes (optical reading devices, photo composing automatic units, displays, microfilming equipment and others).

Researches are especially promising on problems of teleprocessing of scientific and technical information and the possibilities of building a network of automated subsystems (centers). We devote much attention to them, inasmuch as the creation of such a network would be in accord with tendencies of development of world information practice and will mean the transition of MSNTI to a qualitatively new level.

One practical result of the complex of research and experimental work by MTsNTI on utilization of teleprocessing system programs, development of applied programs and means of teleaccess to distant bases has been the creation of a system of teleaccess to the data base of scientific-technical information (MTsNTI network) with utilization of electronic computers and equipment produced in CEMA member countries. This system has been operating in the industrial mode since 1981.

In February 1983, we conducted for the first time an experiment jointly with the USSR Academy of Sciences on interactive long-distance access to data bases involving the use of a communications satellite employing the route Vladivostok--orbit--Moscow (MTsNTI) and beginning in March 1983 in CEMA member countries jointly with the Cuban Academy of Sciences (Institute of Documentation and Scientific and Technical Information) (IDIKT, Havana), a complex experiment has been conducted on teleprocessing of data bases by means of a communications satellite utilizing the route Moscow (MTsNTI)--orbit--Havana (IDIKT).

[Question] How did MTsNTI enroll in international cooperation in the field of scientific and technical information?

[Answer] Relations between MTsNTI and CEMA organs at the present time are determined by a Protocol on the Character and Forms of Cooperation Between the International Center of Scientific and Technical Information and the Council of Economic Mutual Aid signed 10 February 1982 (previously these relations were regulated by the Protocol on Cooperation between MTsNTI and CEMA of 6 May 1972).

According to the aforesaid document, MTsNTI cooperates on a contractual basis with CEMA as a specialized organization and coordinates its work with CEMA work, first of all with regard to questions relating to the functioning and development of MSNTI of CEMA member countries and with respect to scientific research pertaining to scientific-technical information.

On the basis of concluded agreements MTsNTI cooperates in the field of scientific and technical information with the International Institute of Economic Problems of the World Socialist System (Moscow), the International Scientific-Research Institute of Management Problems (Moscow), the Coordination Center of the Intergovernmental Commissions for Cooperation of Socialist Countries in the Field of Computer Technology.

On the basis of contracts concluded between MTsNTI and CEMA, MTsNTI participates in the International Nuclear Information System (MAGATE) and the International Reference System of Information Sources on the Environment (YuNEP) and carries out processing and input of information on behalf of CEMA on documents prepared within a framework of multilateral cooperation, and they use the information obtained from the systems. MTsNTI is a regional center of the International Data System on Periodical Publications (UNESCO) as well as an observer member of the International Organization for Standardization.

The Center maintains permanent working ties with UNESCO and the World Organization for Protection of Intellectual Property.

Agreements have been concluded on cooperation of MTsNTI in the field of scientific and technical information with the Academy of Finland and the International Center for Information and Training in Computer Technology (Budapest). Cooperation is successfully developing with INTERPROGRAMMA Scientific-Research and Planning Institute (Sofia) and Robotron Combine (Dresden).

[Question] What are the basic tasks of MTsNTI in the immediate years ahead?

[Answer] In past years, MTsNTI achieved significant results and has acquired much experience in all aspects of its work. This as well as the friendly international collective of highly skilled specialists and a modern material and technical base are a pledge of the successful development of MTsNTI over the long term. In this connection, the following objectives will be basic in MTsNTI's work:

- improving coordinated operation and compatibility of MSNTI subsystems and boosting efficiency of their functioning;

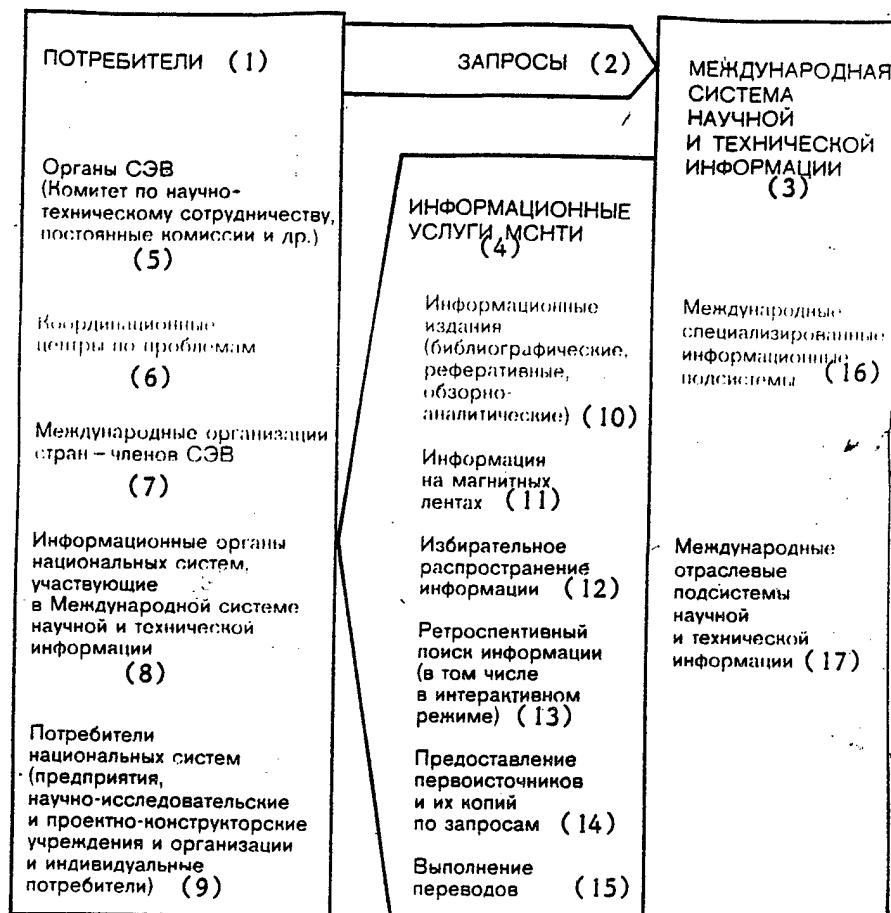
- expanding scope and forms of information-reference services based on utilization of MTsNTI data base as well as preparing of a broad spectrum of problem oriented information publications;

- active dissemination of accumulated MTsNTI experience in the field of modern information technology and information services.

Work will be continued on the development of a network information technology; in particular, it is planned to significantly expand as soon as possible the MTsNTI network. Much has to be done in the field of creating standard program-logic aids for processing arrays of documentary and factographic information, including in the field of minicomputer utilization.

A very important and promising direction of the Center's operation is the analysis of large problem-oriented information arrays for the purpose of bringing to light general patterns and tendencies of development of science and technology in this or that specific field. We have already developed and tested original program aids and methods of statistical analysis of data bases. This is a good foundation for further work.

# Generalized Scheme of Information Services



## Key:

1. USERS
2. REQUESTS
3. INTERNATIONAL SYSTEM OF SCIENTIFIC AND TECHNICAL INFORMATION
4. MSNTI INFORMATION SERVICES
5. CEMA organs (Committee for Scientific-Technical Cooperation, permanent commissions and others)
6. Problem coordinating centers
7. CEMA international organizations of CEMA member countries
8. Information organs of national systems participating in the International System of Scientific and Technical Information
9. Users of national systems (enterprises, scientific-research and planning-design institutions and organizations and individual users)
10. Information publications (bibliographic, abstract, survey and analytical)
11. Information on magnetic tape
12. Selective information dissemination
13. Retrospective information retrieval (including in interactive mode)
14. Presentation of primary sources and their copies according to requests
15. Performance of translations
16. International specialized information subsystems
17. International sectorial subsystems of scientific and technical information

# Data Bases Processed at MTsNTI

База данных (1)	Состав информации и тематика (2)	Вид и язык описания документов (ОД) (3)	Начало обработки (4)	Прирост за год (тыс. ОД) (5)	Объем на 1.01.1983 г. (тыс. ОД) (6)
МСИС НИР (7)	Отчеты о НИР и диссертации стран - членов СЭВ по всем областям науки и техники (9)	Рефераты на русском языке (10)	1.01.1973 г. (11)	40	240
INIS	Статьи, труды конференций, патенты, отчеты о НИР (12) по атомной науке и технике	Рефераты на английском языке (13)	1.01.1977 г.	70	420
INSPEC	Статьи, труды конференций, патенты, отчеты о НИР по физике, электротехнике, электронике, вычислительной технике и теории управления (14)	Рефераты на английском языке (15)	1.07.1978 г.	160	540
SPIN	Статьи по фундаментальной физике, астрофизике и астрономии. (16)	Рефераты на английском языке (17)	1.01.1979 г.	25	100
CPI	Труды конференций, симпозиумов по всем областям науки и техники (18)	Название конференций и докладов на английском языке (19)	1.01.1980 г.	100	300
COMPENDEX	Статьи, труды конференций, патенты, отчеты о НИР по техническим и технологическим вопросам науки и техники (20)	Рефераты на английском языке (21)	1.01.1982 г.	100	100
SCI	Статьи по всем областям науки (22)	Названия статей на английском языке (23)	1.01.1982 г. в экспери- ментальном режиме (24)	500	-
Общий объем: (25)				995	1860

## Key:

1. Data base
2. Information and subject matter
3. Type and language description of documents
4. Beginning of processing
5. Yearly growth (thousands of document descriptions)
6. Volume as of 1 Jan 1982 (thousands of document descriptions)
7. International specialized information systems' scientific-research work
8. MTsNTI KIB [information base codes]
9. Reports on scientific-research work and dissertations of CEMA member countries for all fields of science and technology
10. Abstracts in Russian language
11. 1 Jan 1973 [et seq]
12. Articles, proceedings of conferences, patents, reports on scientific-research work on nuclear science and technology
13. Abstracts in English language
14. Articles, proceedings of conferences, patents, reports on scientific-research work on physics, electrical engineering, electronics, computer technology and control theory
15. Abstracts in English language
16. Articles on basic physics, astrophysics and astronomy
17. Abstracts in English language

[cont'd on next page]

Key (concl'd):

- |   |   |
|---|---|
| 18. Proceedings of conferences, symposiums in all fields of science and technology  | 21. Abstracts in English language         |
| 19. Names of conferences and reports in English   | 22. Articles in all fields of science     |
| 20. Articles, proceedings of conferences, patents, reports on scientific-research work on technical and technological questions of science and technology | 23. Names of articles in English language |
|   | 24. 1 Jan 1982 in experimental mode       |
|   | 25. Total volume                          |

As before, a great deal of attention will be paid to cooperation in the development of national systems of scientific and technical information of CEMA member countries, first of all to assistance to the Socialist Republic of Vietnam, the Republic of Cuba and the Mongol People's Republic.

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SOME STEPS FOR INCREASING INTRODUCTION OF COMBINED MECHANIZATION AND LEVEL OF ANALYTICAL RECORD-KEEPING IN THE LATVIAN NATIONAL ECONOMY

Riga IZVESTIYA AKADEMII NAUK LATVIYSKOY SSR in Russian No 2, 1984  
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[Article by V. P. Salkazanova, Latvian "Order of Red Banner of Labor"  
State University imeni Petr Stuchka]

[Text] One cannot manage and plan if record-keeping is not set up well. The expounder of theory and tactics of proletarian revolution, K. Marx, viewed records in his work as a tool for economic and social management of economic processes. Thus, in the definition of K. Marx, "bookkeeping records as a means of checking and mentally generalizing this process become all the more necessary, the more the production process occurs on a public scale and loses a purely individual nature...."<sup>1</sup>

The loyal follower of K. Marx and F. Engles, Vladimir Il'ich Lenin, creatively developed marxism under historically new conditions, in particular the teaching of Marx on records, which first emerged to serve the working people. Lenin viewed record-keeping as an important function in running the government, and he gave a new definition of the purpose of records as a means of checking the measure of labor and measure of consumption. Already on the eve of the Great October Socialist Revolution, in his work entitled "The State and Revolution; Marxist Teaching on the State and Tasks of the Proletariat in the Revolution," he stated with insight: "Records and control are the main factors required to 'put in order,' for proper function of the first phase of a communist society."<sup>2</sup>

Soon after the victory of the Great October Revolution, in March-April 1918, V. I. Lenin wrote the article, "Next Tasks for Soviet Power," in which he clearly formulated and gave an in-depth analysis of the objectives stated at that time for keeping records. In particular, he observed that the "main difficulty lies in the area of economics: to implement the strictest and fullest record-keeping and control of production and distribution of products, augment labor productivity and de facto socialization of production."<sup>3</sup>

It was Lenin's idea that taking stock is a mandatory and necessary condition for order and organization. For this reason, in implementing the legacies of the great Lenin, the CPSU and Soviet government devoted and continue to

devote much attention to proper organization and refinement of record-keeping as a means of efficient management of the national economy at all stages of building of communism and advancement of the economy of our state.

Proceeding from the lines of the 26th CPSU Congress and subsequent plenums of the CPSU Central Committee, in the 1984 plan and budget there was emphasis on orientation of achieving better end results in the national economy. Thus, with the planned growth of industrial production by 3.5%, as compared to last year, profit in all sectors of the national economy should increase by 4.9%. The established goals can be reached by accelerating scientific and technological progress, improving utilization of the economic potential that has been produced and increasing labor productivity.

Cost accounting of associations, enterprises and their departments must direct itself to implementing these tasks, and the record-keeping system should also help in this goal, since keeping records and cost accounting are organically interrelated. No matter how perfect the system of cost accounting indicators of performance of associations and enterprises or their intramural departments, no matter how detailed their descriptions in the plan, if these indicators or data used to estimate them are not properly reflected in records, cost accounting is virtually nonoperational, its levers and incentives are not effective. Strict documentary validation, strict regulation and intramural self-checking lend cost-accounting indicators reflected in the records the authority of legal evidence, which makes it possible to give incentives for achievements that are really made and initiate physical and moral liability for unquestionable oversights.

The existing system of keeping records as a whole in Latvian SSR provides for the needs of the national economy. Centralization of records has been essentially completed, and significant measures have been implemented to adopt progressive forms and methods of record keeping. As of 1 January 1983, 86.7% of the associations, enterprises and economic organizations had centralized systems of keeping records; there were 61 centralized bookkeeping offices servicing 481 enterprises with a self-contained budget. In this republic, almost 13.5% of the enterprises and organizations used the table and punchcard method of record keeping, while 36.6% of the enterprises used the current bookkeeping method of keeping records of materials. The number of associations and enterprises keeping records of tools by the circulating capital method and document-free exchange constituted 28.7%, while 6.3% of the enterprises practiced remittance of wages and remuneration for labor according to the end production operation without advances. Only 5.3% of the republic's enterprises adopted elements of the standardized method of keeping records of expenses for production.

At present, among the pressing problems of further improvement of record keeping in the republic's national economy, there are two particularly critical ones. They include the need for further increase in integral mechanization and analytical quality of records, which is due to the current need to make some free time available to the bookkeeping services for checking and analytical work by means of wisely relieving them from technical and routine accounting operations.

Since publication in 1980 of the Decree of the USSR Council of Ministers<sup>4</sup> and the corresponding Decree of the Latvian Council of Ministers<sup>5</sup> "Steps to Improve Organization of Accounting Records and Advancing Their Role in Wise and Economical Utilization of Physical, Manpower and Financial Resources," concrete measures are being actively instituted to implement these important documents. These decrees touch upon more than mere record keeping--better support of its services with automation and mechanization equipment, expansion of which is given serious attention in the national economy of Latvian SSR.

In particular, work is continuing to upgrade the Latvian RASU [republic automated control system] as a republic-level automated and integrated system of gathering, transmitting, accumulating and processing information for record-keeping purposes, as well as planning and control of the national economy, which includes all Union-republic and republic ministries and agencies, as well as the leading enterprises under Union jurisdiction that are on the territory of Latvian SSR. In addition, all of the republic's ministries and agencies are working on development or introduction of agency-level automated control systems. The organizational and technical base of automated control systems in this republic's national economy consisted, as of 1 January 1983, of 59 computer centers, departments, laboratories and other divisions of associations, enterprises and organizations. In addition, there are 15 agency-level computer stations and 17 computer offices at enterprises and in associations of this republic.

The expenses for upkeep and operation of electronic and computer equipment used in the system for control of associations, enterprises and organizations, as well as expenses to pay for the pertinent work performed for the control system on the basis of contracts by computer centers, stations and offices that are not on their budget, are included in the expenses for upkeep of the control apparatus which are limited by maximum allocations. The breakdown of expenses for upkeep of the control system is defined by the USSR Ministry of Finance and USSR Central Statistical Administration, and starting in 1970 the expense data have been reflected in the quarterly and annual "Report on expenses for upkeep of control systems of enterprises and organizations operating on a cost-accounting basis" (Form No 14) under the rubric of other expenses. Since 1972, in this form of annual report the expenses for operating computer centers, stations and offices that are not on the budget of enterprises are listed separately.

Determination of maximum allocations, which started in 1970, was motivated by the desire to upgrade the control system and reduce the expenses for its upkeep, since there are duplicated organizations in some sectors of the national economy, unwarranted large staffs in the control apparatus of small enterprises, the structure of which was established, in many instances, by analogy to large enterprises. This is why the CPSU Central Committee and USSR Council of Ministers adopted the decree dated 13 October 1969, No 822, "On Steps to Upgrade and Reduce the Cost of the Control Apparatus,"<sup>6</sup> which placed personal responsibility, along with other steps, upon the administrators of associations, enterprises and organizations for spending funds to maintain the control apparatus in accordance with the allocations earmarked for this purpose.

In view of the fact that the system is still large and expensive, it was indicated that there are many excesses in spending funds for all sorts of business trips, acquisition of furniture, stock and other equipment for business premises, numerous unnecessary meetings, conferences and symposiums, and particularly that ministries and agencies, administrators of associations, enterprises and organizations do not take the proper steps for mechanization and automation of management work.

The consistent growth of social production in Latvian SSR, the constant increase in volume of accounting information and higher demands with regard to its currentness and comprehensiveness of quantitative and qualitative indicators of management performance were instrumental in the annual growth of extent of mechanization and automation of record-keeping information which, in turn, also increased the overall expenses for processing it. The sampling taken by this author of data from the annual reports of 22 centralized bookkeeping economic bodies that make use of the services of extraneous computer installations revealed that the total expenses for mechanized and automated processing of accounting data constituted 167,000 rubles in 1972, 511,000 rubles in 1975, 1,417,000 rubles in 1980 and 1,845,000 rubles in 1982, i.e., they increased by more than 11 times in 10 years.

This growth was due primarily to the drastically increased volume of accounting work, as well as the fact that the age of operating punchcard computers is coming to an end and, as we know, the upkeep and operation of third-generation computers is much more expensive. Under the years of the 10th and 11th five-year plans, the computer resources of the Latvian national economy increased by 98%, as compared to 1975, and second-generation computers have been replaced with expensive third-generation machines, which already constituted more than 75% of all computers in 1984. Moreover, the growth in cost of mechanized and automated processing of accounting information is also partially attributable to introduction of a standardized fee schedule for the nation's entire national economy for work done for associations, enterprises and organizations.

The increased expenses for mechanized and automated processing of accounting information causes increase in expenditures for upkeep of the control system that are limited to the maximum allocations, which ensues from the foregoing. However, no additional limits are allocated in the upkeep of the control apparatus for the objective increase in cost of mechanized and automated processing of accounting information or measures approved in plans for these purposes to ministries and agencies. It should be noted that the maximum allocation limit for upkeep of the control apparatus as a whole is represented by a lump sum for Latvian SSR, as for other Union republics, which is distributed among the appropriate systems in the republic.

In the opinion of this author, the existing procedure for including the cost of mechanized and automated processing of accounting information in expenses for upkeep of the control system, which are limited by maximum allocations, has several negative aspects, and the main ones include the following.

In the first place, unequal conditions are established for associations and enterprises of the national economy, i.e., a lower limit of maximum allocations for upkeep of the control apparatus, to cover expenses for upkeep and operation of electronic and computer equipment is required for enterprises that

have their own computer installations than enterprises and associations that make use of the services of outside computer installations, since the allocated limit should not be used to cover overhead and certain other expenses of computer installations that render these services on a contractual basis. Thus there is a rift in need for maximum allocation limits for these purposes.

Typical examples are the systems of the Latvian Ministry of the Food Industry, Latvian Ministry of the Forestry and Timber Industry, Latvian Ministry of Local Industry and, particularly, this republic's Ministry of Municipal Services which have been experiencing, for the last 7 years already, an acute shortage of allocations for upkeep of the management system and, for this reason, cannot make intensive plans and conclude complete coordination agreements with the Republic Computer Center of the Latvian Central Statistical Administration for introduction of mechanization of record-keeping work. In 1982, only 12 organizations were linked up for services to the Republic Computer Center of the Latvian Central Statistical Administration, for the purpose of processing some parts of the records.

In the second place, the existing procedure of including the costs for mechanized and automated processing of economic accounting information seriously hampers future changeover of agency computer centers, stations and office to complete cost accounting, since this change is being delayed by the lack of free limits of maximum allocations for upkeep of the management apparatus. This applies to most industrial ministries that have computer installations. We find here so-called "double accounting" within the same system, which cannot be considered a normal phenomenon.

In the third place, there is delay in improving the efficiency of using computers in this republic's national economy and, primarily, those installed at the agency computer stations and offices. The mean daily work load for one average machine at national economy computer stations has been 2.7-3.5 h less since 1970 than at the computer installations of the Latvian Central Statistical Administration, and the difference is even greater for some types of machines. For example, the mean daily load for tabulators at computer stations of the national economy constituted 7.9 h in 1982, versus 12.3 h at computer installations of the republic's Central Statistical Administration system. As for mean daily work load of computer offices of the national economy, it averages 40% of the standard.

There is a significant reserve of computer time in the national economy. Thus, due to lack of work, off time constituted 13,200 machine-hours in 1982 with regard to YeS [single series or run] computers, which is tantamount to not using 2.5 computer units of the YeS-1020-1035 group for 1 year. The YeS-1033 is not being used efficiently enough by the Computer Center of the Riga Electric Light Bulb Plant, and this also applies to the YeS-1022 use by the Computer Information Center of the Latvian Ministry of Municipal Services, where mean daily use of these computers constituted 31 and 65% of the planned work load in 1982, according to the records.

The small mean daily work load of many agency computer installations is related to the fact that they provide services in mechanization and automation of record-keeping mainly on the basis of individually developed plans and some of them do so only for associations, enterprises and organizations where

they are located, which restricts the volume of such services. The low mean daily work load of computer equipment is also attributable to the above-mentioned second negative factor in the existing procedure for including the cost for mechanized and automated processing of record-keeping information, i.e., the fact that it is still being used at many computer installations of the national economy that have not yet changed to cost accounting.

Hence, the noncost-accounting computer installations are not trying to change to the industrial method of operation and make the expenses commensurate with income, as well as provide for profitability, which also means that they are not interested in obtaining additional customers annually within the limits of their available capacity or in constantly expanding mechanization and automation of record-keeping to an integral level.

In the last 5 years, introduction of integrated mechanization of record-keeping has occurred at 123 enterprises and associations of Latvian SSR: as of 1 January 1978, it was used by 166 enterprises and associations, versus 289 as of 1 January 1983. Most work on introduction of integrated mechanization of record-keeping was done by the Latvian Ministry of Agriculture at sovkhoses by coordinated agreements with computer installations of the TsSU [Central Statistical Administration] of this republic. At the present time, 81% of all enterprises and associations that have adopted mechanized record-keeping is referable to the system of this republic's Ministry of Agriculture.

As for enterprises and associations in industrial sectors, the level of introduction of integrated mechanization of accounting does not even reach 5% of the total number of enterprises that have adopted it. In 1982, only 2 enterprises under the Latvian Ministry of the Meat and Dairy Industry adopted integrated mechanization of record-keeping. In most ministries and agencies, instead of integrated introduction of mechanized record-keeping in their systems, work is being done to expand mechanization only in some parts of the records. For example, statistical records indicate that, in 1982, the number of enterprises in which there is mechanization of records of physical assets increased by 161, whereas for records of finished products and their sales it increased by 94.

It is evident from these data pertaining to the Latvian Ministry of Agriculture that, under conditions of a general procedure to include expenses to pay for mechanization and automation of record-keeping work with expenses for upkeep of the management apparatus, limited by maximum allocations, it would seem that there are no objective obstacles at all for purposeful work to expand the range for use of integrated mechanization of record-keeping. In reality, however, the basic credit for achieving such a high level of introduction of integrated mechanization of records at the republic's agricultural enterprises belongs to the devotees of agricultural record-keeping, planners and persons in charge of the Republic Computer Center in the TsSU system of Latvian SSR, who were skillful in posing questions to the USSR Ministry of Agriculture and USSR TsSU. As a result of such coordination, the nation's Ministry of Agriculture and USSR TsSU, through an appropriate directive, made it incumbent upon this republic's Ministry of Agriculture to introduce integrated mechanization of accounting at kolkhoses and sovkhoses.

The achievement's of the republic's agricultural system in introducing integrated mechanization of record-keeping caused systematic overexpenditure of the limits allocated for these purposes. For example, this republic's Ministry of Agriculture experienced particular difficulties because, for a period of 13 years, it annually exceeded the allocation limits for upkeep of the management system for these purposes by 500,000 rubles. But then, the kolkhozes and sovkhoses of Latvian SSR achieved the most with regard to introduction of integrated mechanization of record-keeping, not only in comparison to associations and enterprises of this republic's and the nation's national economy, but to sovkhoses and kolkhozes under the USSR Ministry of Agriculture. For example, complex mechanization of record-keeping was introduced in Ulyanovsk Oblast in the first sovkhos only in 1977,<sup>7</sup> whereas in LaSSR, 35 sovkhoses introduced it, not counting the same number of kolkhozes.

We are also mindful of the fact that, for Latvian SSR as a whole, the limits for these purposes are exceeded each year. In 1982, in the national economy of our republic the limit was exceeded already by about 5 million rubles for upkeep and operation of electronic and computer equipment used in the management system, as well as expenses to pay for mechanized and automated processing of accounting information, which was done for the management apparatus by agreement with computer centers, stations and offices. In essence, due to the lack of free limits of maximum allocations for upkeep of the management apparatus, many Latvian ministries and agencies squander government funds for introduction of individual sections of mechanization of accounting without proper return and efficiency. This delays further expansion of work to introduce integrated mechanization of accounting and is instrumental in widening the already broad gap in the republic between the high degree of technical equipment in industry and low supply of equipment for the workers in the managerial system. Yet, under modern conditions, development of scientific and technological progress should be reflected in all areas of activity of the national economy. It was expressly indicated in the June (1983) Plenum of the CPSU Central Committee: "... to drastically reduce the use of manual labor, primarily by means of integrated mechanization."<sup>8</sup>

Of course, it is imperative in the future to reduce and simplify the management apparatus, and a fully justified and effective step for this was, for example, introduction in 1982 of a limit to the number of employees in the management apparatus. However, in order to solve the first of the problems we mentioned (if we are not to assign officially additional limits of maximum allocations for upkeep of the management system to cover the objective increase in cost of mechanized and automated processing of accounting information or approved planned measures for these purposes), in our opinion such expenses should be included with the expenditures for upkeep of the management apparatus that are not limited to maximum allocations, rather than in limited maximum allocations, i.e., they should not be reflected in the first part of the quarterly and annual "Report on expenses for upkeep of management system of enterprises and organizations operating on a cost-account basis," on form No 14, but in the second part of this form.

When using computer equipment to process accounting information, unified forms of primary documents play a significant role. With operating automated control systems, supply of information acquires special significance,

which means that there is full reflection in primary documents of all aspects of management. And this is understandable, since primary data about the economic status of the controlled facility are fed into the input of mechanization and automation of record-keeping. For this reason, with mechanized and automated processing of primary documents, it is of basic importance to solve the second problem, which is related to properly constructed primary documentation.

Development of a rational system of documentation is a rather difficult and responsible task of relevance to the national economy. After all, the forms of documents are made up to apply to the distinctions of operations, the content of which they are to reflect; for this reason, it is of enormous importance to construct documents correctly: their form indicates expressly what information should be indicated in executing a given operation.

Much work is being done in our country to develop interagency forms for primary accounting documentation, which are used regardless of agency jurisdiction by all associations, enterprises and organizations of the national economy. Appropriate changes are made as needed in the forms for primary records, which are due to publication of new documents pertaining to standards, practical expediency and other causes ensuing from the actual management of associations, enterprises and organizations. For example, in the interagency forms of primary records on personnel, changes were made in 1975, 1977, 1979 and 1980; changes were made in 1976 in the forms for keeping records rationalization proposals and inventions, etc.

We consider it necessary in the future, not only "... to refine records documentation and accounting on all levels of the national economy consistent with modern requirements for management, planning and analysis of economic activities with efficient use of electronic and computer equipment,"<sup>9</sup> as noted in the "Basic directions of economic and social development of the USSR in 1981-1985 and up to 1990," but to critically revise and put in order the current requisites of interagency forms for primary records and increase requirements as to writing up economic operations, at which point the accounting system begins to effect its control functions.

We shall now discuss some of the interagency forms of primary records that are used in the entire national economy, some requisites of which excessively increase the volume of primary records and are not consistent with the instructions on how to write them up or do not conform to standards that are current, or else, being the basic ones, are wanting, which has a particular impact on quality of plans for mechanization and automation of record-keeping, which also means on quality of tabulated forms and print-outs. In this regard, I have offered the following recommendations to improve the forms for primary records as determined by the nature and volume of current accounting information needed for direct, routine management of operation of associations, enterprises and organizations, and for establishing the accounting correlations between their different operations departments and production units or shops.

According to existing requirements, the form for keeping records of personnel, No T-8, "Order (instructions) to terminate work contract," is prepared in one

copy, and on its reverse side is the settlement with the blue- or white-collar workers, for which reason it is filed with the account documents of the book-keeping service. Thus, this form is not available in the personnel department of the association, enterprise or organization, although the duties of that department include organization and keeping of personnel records.<sup>10</sup> The necessity of originals orders concerning dismissal of blue- and white-collar workers in the personnel department is related not only to questions of administration of activities within the organization. They could be requested for comprehensive audits of documents, special-purpose and other checks. But when blue- and white-collar workers are dismissed at the initiative of management, it is often necessary to send out copies of orders to councils of trade-unions, people's courts, procurator's office, as well as to the dismissed individuals themselves.

As a result, many associations, enterprises and organizations keep a log of orders in an arbitrary form, concurrently with orders in the established form. For this reason, it is recommended that the verso of the form, "Order (instructions) to terminate work contract," which contains settlements for dismissal with 90 requisites be abolished, and that the settlements be made at the settlement-remitting agencies as a regular procedure, since the basis for calculating wages to blue- and white-collar workers for the settlement period are still the data in primary documents for keeping records on output or work done, actual work time, overtime sheets, etc.

For the same reasons, it is also recommended to do away with the calculations of leave payment with 98 essential elements on the verso of the interagency form of personnel records No T-6, "Entries concerning granted leave." Then the orders to terminate work contracts and leave permits would remain in the personnel department, it would no longer be necessary to duplicate them, there will be a reduction in volume of primary documents pertaining to records of work and wages, and the printing office will be less loaded as a result of reducing the number of essential elements [requisites].

In critical periods of possible overexpenditure from the wage fund by the relevant economic service of the association, enterprise or organization, in drafts of "Orders (instructions) for hiring" of the interagency form for keeping personnel records, No T-1, it is recommended to furnish conclusions according to the established requisites pertaining to salary, wage category and particularly about any possible additional allowances. Such a temporary measure could be effective in precluding overexpenditure of the salary fund.

Some interagency forms for primary records of fixed assets also need to be further improved. They include form No OS-1, "Certificate for receipt and transfer of fixed assets," where there is no column for "number of items" and, consequently, it is intended for receipt or transfer of only one item although according to Article 41 of the statute for keeping records of fixed capital approved by the USSR Ministry of Finance on 8 May 1976, as No 30, there are also provisions for a general document for business inventory, tools, lathes, if they are of the same type, same in cost and were received at the same time.

It should be noted that in the statute No 125, which was previously in effect and issued on 6 May 1963 by the USSR Ministry of Finance for keeping a

record of fixed assets was not coordinated with the essential elements in the form for 13 years. It is suggested that the requisite of quantity of items be added to this form in order to coordinate it with form No OS-1.

At many enterprises, there is still unsatisfactory storage of specifications for fixed assets. This was found, in particular, when fixed assets costing 50 to 100 rubles were transferred to circulating assets as of 1 January 1980. There is nothing surprising in this: there is no appropriate control over the received documentation, although Item 42 of the statute for keeping records of fixed assets provides for transfer of available technical documentation about the received item to the appropriate department. Most often, documents are lost when fixed asset items are transferred within an organization. For this reason, it is expressly when making a transfer that the invoice for intramural relocation of fixed assets on form No OS-2 that it is necessary to reflect, along with the item, the transfer of technical specifications, and in order to put in order the storage of technical documents referable to fixed assets and make sure it is better preserved, it is desirable to add to form No OS-1, "Certificate for receipt and transfer of fixed assets," the requirement of endorsement by the chief of the service that received the technical documentation.

As for form No OS-9, "Inventory card for group record of fixed assets," it has two flaws. The first is that there is no indication of quantity of items, which has to be calculated by dividing the column of initial cost of all items by the column of initial cost of one item. It is the purpose of the group record inventory card to have a record of "indicator of total quantity of initially received items," and for this reason it is the practice of record-keeping workers enter this indicator at the top of the card. The second flaw in the form is related to the fact that the fixed asset items listed on the inventory card do not all break down and are not withdrawn at the same time. At the present time, entries are made on such cards in the item section, opposite which there are withdrawal columns, so that one has to calculate the quantity of fixed asset items remaining in operation. Thus, there are no data about what remains on form No OS-9, either at the start of the recording period or at the time when some items have already been withdrawn. For this reason, one should add to the group record inventory card for fixed assets a column for quantity of items received and at the bottom of this form a column, "Quantity of fixed asset items with lower total after withdrawal of some of them."

Form OS-16, "Estimation of motor vehicle depreciation," which was developed relatively recently, also fails to fully meet today's requirements, since its essential elements have been worked out only to calculate depreciation for total restoration on the basis of established norms of depreciation deductions as percentage of initial cost for calculation of depreciation for major overhaul, on the basis of percentage of vehicle cost per 1000 km actually traveled. However, depreciation for complete restoration is also calculated on the basis of percentage of vehicle cost per 1000 km actual driving for a number of vehicles, in accordance with the existing norms for depreciation deductions for fixed assets of the USSR national economy, approved by the USSR Council of Ministers on 14 March 1974, and this is not reflected in the elements of the form. As a result, the bookkeepers have to

prepare estimates in an arbitrary form, spending additional time on this and "cluttering" up the record with them, which is in contradiction to decree No 59 adopted by the USSR Council of Ministers on 24 January 1980, which forbids the use of documentation forms that do not conform to the approved specimens. For this reason, this form too should be made to conform with the standard document, and it should have an additional column for calculation of depreciation for full restoration on the basis of percentage of cost per 1000 km of actual travel, with distinction of a column for making the appropriate calculations and subcolumns to enter the obtained depreciation amount.

True, the above recommendations involve expansion of record information by seven elements, but one cannot simplify record-keeping for the sake of simplification itself; under conditions of mechanization and automation of record-keeping, it should be determined by practical expediency and must not weaken analytical work. When using computers to process record data, a reduction in volume of primary information should be achieved only by eliminating superfluous information contained in primary documents, which is not used in subsequent processing and derivation of permanent standard-reference data.

Practical implementation of the recommendations is aimed at further expansion of integrated mechanization, improving currentness and analytical nature of record-keeping, which is called upon to strengthen cost accounting and perform routine effective control over wise and economical utilization of physical, manpower and financial resources.

#### FOOTNOTES

1. K. Marx and F. Engels, "Works," Vol 24, p 153.
2. V. I. Lenin, "Complete Collection of Works," Vol 33, p 101.
3. Ibid, Vol 36, p 171.
4. SPP SSSR, No 6, 1980, pp 123-127.
5. VEDOMOSTI VERKHOVNOGO SOVETA I PRAVITEL'STVA LATVIYSKOY SSSR, No 22, 29 May 1980, pp 1021-1025.
6. SPP SSSR, No 24, 1969, pp 610-613.
7. "Seen in Newspapers," BUKHGALTERSKIY UCHET, No 5, 1983, p 45.
8. "Materialy Plenuma TsK KPSS, 14-15 iyunya 1983 g." [Proceedings of Plenum of CPSU Central Committee, 14-15 June 1983], Moscow, Politizdat, 1983, p 11.
9. "Basic Directions of Economic and Social Development of the USSR in 1981-1985 and for the Period up to 1990," Riga, Izd-vo TsK KP Latvii, 1981, pp 81-82.
10. "Kvalifikatsionnyy spravochnik dolzhnostey sluzhashchikh" [Guide to Job Qualifications for White-Collar Workers], Moscow, NII truda, 1976, p 142.

11. SOBR. POSTANOVLENIY PRAVITEL'STVA SSSR, No 6, 1980, pp 123-127.

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## MACHINEBUILDING TRADE UNION HEAD DETAILS INDUSTRY PROGRESS

Moscow MASHINOSTROITEL' in Russian No 2, Feb 84 pp 1-4

[Article by A. Ya. Rybakov, chairman of the central committee of the machine building and instrument making industries workers trade union, member of the CPSU Central Committee, and Hero of Socialist Labor: "For Acceleration of Scientific-Technical Progress"]  
[Text]

Accelerating scientific-technical progress is a most important component of the whole contemporary economic policy of the CPSU. The CPSU Central Committee and USSR Council of Ministers decree "On Measures to Accelerate Scientific-Technical Progress in the National Economy" says that solving questions of fundamentally increasing labor productivity on the basis of extensive and accelerated introduction into practice of the achievements of science, engineering, and progressive experience in accordance with the decisions of the November 1982 and June 1983 Plenums of the CPSU Central Committee is impossible without fundamentally improving all work to accelerate scientific-technical progress.

As is well-known, the machine building industry is the main transmitter of scientific-technical progress in the national economy. It is precisely through machines, machine tools, and equipment that all progressive technical ideas aimed at increasing the efficiency of public production are realized. Only the contemporary machine building industry is capable of fundamentally reorganizing production on the basis of comprehensive automation and robotization and the development of flexible automated production facilities (GAP) which, in their turn, are for all practical purposes the only means to increase labor productivity. In recent years in the sector's enterprises the rate of renewal of output under production has increased, the number of descriptions of newly incorporated equipment has risen, and the proportion of articles of the highest quality category has increased.

For example in the first 2.5 years of the 11th Five-Year Plan, Ministry of Instrument Building Industry associations and enterprises have incorporated about 1,400 new instruments, means of automation, and computer equipment which are used in practically all sectors of the national economy; more than 500 assignments envisioning work programs to solve scientific-technical problems have been fulfilled; more than 600 obsolete types of output have been removed from production; more than 2,000 industrial robots and manipulators have been introduced, on the basis of which 590 robotic complexes have been developed

and are functioning; 600 automated control systems have been put into operation in various sectors of the national economy; and active work to develop GAP's is being carried on.

Active work to put programs of robotization and efficient technical re-equipping into operation is being done at the Orel Prompribor Production Association where robots are being successfully used in the production of temperature controls; at the Saransk Instrument Building Plant imeni 60-letiya SSSR a robotic complex is being used to manufacture bellows; and at the Leningrad Electromechanical Plant imeni 60-letiya SSSR Production Association, a section of the cold stamping shop has been robotized.

Ministry of Machine Building for Light and Food Industry and Household Appliances enterprises have increased production of technological equipment for the light and food sectors of industry by 7 percent on the basis of technological re-equipping of enterprises. In the first 2.5 years of the current five-year plan the Ministry of Machine Tool and Tool Building Industry has manufactured and tested about 2,000 experimental models and equipment, produced 1,508 assembly series, including more than 750 models of technological equipment, and removed 527 articles of obsolete design from production. However, the rate of increase in production of progressive equipment and in its technical-operating indicators still lags behind present demands.

Scientific-research, design, and planning and technological organizations are called on to play an important part in realizing the main directions of the development of scientific-technical progress, since it is precisely in the planning and development stage of new types of machines and equipment that those operational features upon which the technical level of novelties being produced depend are incorporated.

There are many examples when this work and the intense sense of responsibility for the assigned work makes it possible to achieve good final results. The Cherkassy Planning and Design Technological Institute in conjunction with a number of sector organizations as well as in cooperation with the Ukrainian SSR Academy of Sciences has developed a production line for plasma spraying of machine parts during processing of man-made fibers and textile threads. New technology reduces expenditures for producing spare parts by 10 times and frees dozens of people employed in their manufacture and repair. Each plasma spraying complex saves up to 120-130 tons of metal.

In recent years leading enterprises and organizations in machine building sectors have been using a systematic approach to developing new types of equipment and technology increasingly often; and they have been building promising models and comprehensive systems of machines, aggregates, and production flow lines. As a result the level of standardization and "compatibility" of parameters of certain assemblies and blocks is being raised. Work to develop fundamentally new equipment with large unit capacities, lower metal and energy consumption, and an increased level of mechanization and automation is being activated.

For example, the Ivanovo Machine Tool Building Production Association imeni 50-letiya SSSR has developed and is using a comprehensive integrated method of organizing work to build new equipment. This method reduces the time needed to develop, plan, and incorporate machine tools into production. An atmosphere of creative research and elevated accountability of each person for the technical level of output being produced has been maintained. Close ties with customers makes it possible to operate the machine tools more efficiently. In addition to accelerated production of new equipment, the collective is conducting extensive work on technical re-equipping of production with broad use of machine tools with digital programmed control. A group of association employees was awarded the USSR State Prize for 1983 for development and industrial introduction of highly efficient equipment for GAP's.

The experience of the Ivanovo machine tool builders in developing and increasing production of highly efficient equipment on the basis of better utilization of scientific-technical and production potential was approved and recommended for extensive dissemination by the presidium of the trade union central committee.

Nonetheless, definitive steps to introduce this experience everywhere were not taken. Frequently development periods are prolonged and by the point of series incorporation they are obsolete. Equipment under production often has serious design errors, has not been adequately studied from a technological point of view, and does not give the desired result. To a great extent these problems stem from the fact that most trade union committees and economic managers are slow to reorganize the work in accordance with demands of the present day and of scientific-technical progress.

To an increasingly greater extent, work on shaping genuine socialist labor sophistication in every laborer should be promoted to paramount importance in the direct, meticulous everyday work of trade union committees and economic managers, since without high production and labor sophistication in every worker, even the most highly efficient contemporary equipment and automated and robotized flow production lines and production facilities will not give the desired increase in the efficiency of the national economy. Moreover, without high labor sophistication and without elevated accountability and qualifications of engineering-technical workers, designers, and technicians, the most contemporary equipment will become "not so contemporary after all." In order for work in this direction to have the necessary results, trade union committees must study production problems indepth and reach every worker, engineer, and specialist. In shops and sections, not to mention the worker position, proposed innovations frequently are not known; plans for introducing new equipment and technology collect only in "high echelons"; labor collectives are inadequately involved in formulating and discussing these plans; and the development and incorporation of new types of equipment often takes place without the participation of leaders of production, innovators, inventors, and sections of NTO's [scientific-technical societies] and VOIR [All-Union Society of Inventors and Efficiency Experts].

Trade union committees and economic managers must take advantage of the rights of labor collectives more extensively for detailed correlation of plans for introducing and developing new equipment and progressive technology with plans

for production, capital investment, material-technical supply, financing, increasing workers incentive in development, and reducing time periods for introducing new equipment models.

Today the creative activism of workers and their interest in the final results of work is one of the decisive factors in indepth reorganization of economic activity and intensification of production. Consequently it is essential to hold regular meetings in trade union groups, departments and laboratories, shops and sections, and standing production conferences where reports from individual executives on their contribution toward performing tasks which face subdivisions are heard, and these reports should be considered an important form of indoctrinating a sense of responsibility for the assigned work and strengthening labor and production discipline.

Collective contracts are an efficient means of mobilizing scientists, technical-engineering workers, and workers to accelerate the development of progressive equipment and technology.

But if we are speaking of scientific-research, design, and planning and technological organizations, they have not become this way. It seemed that trade union committees in conjunction with economic managers were organizing work to formulate these contracts correctly: proposals are gathered; they are discussed in laboratories and departments; but the result is those two-sided agreements in which the tasks of the organization's basic scientific-production activity do not appear. They devote very little attention to questions of increasing the efficiency of scientific and engineering labor and work quality and accelerating periods of development and introduction of new equipment and progressive technology. Consequently it is essential to make sure that collective contracts include practical obligations and measures aimed at qualitative fulfillment of topical plans.

Life demonstrates that the greatest successes and better final results are achieved by those collectives which, along with exemplary labor organization, support and develop in people a sense of the usefulness of and the need for their efforts; affirm genuine socialist labor sophistication; and in the final analysis mold a sense of involvement in the matters and plans of their collective.

Trade union organization work to conserve labor is inseparably linked to accelerating scientific-technical progress and introducing new equipment and progressive technology. Trade union committees of associations and enterprises of the machine and instrument building industries are conducting significant work to improve and develop safe labor conditions and reduce the level of accidents and illness; they are managing to include these measures in collective contracts and are monitoring their fulfillment. It is no secret that a genuine guarantee of safe and favorable working conditions is possible only with a comprehensive approach to mechanization, automation, and robotization of production and active introduction of achievements of scientific-technical progress into each shop, section, and worker position.

Socialist competition is a most important means for mobilizing the creative activism of the masses to search for and utilize production reserves and reserves for accelerating scientific-technical progress and for extensively enlisting workers in production management. The CPSU Central Committee decree "On Improving the Organization and Practices of Summarizing Results of Socialist Competition and Giving Incentive to its Victors" once again emphasized increasing the impact of socialist competition on fulfilling the challenges of the country's economic and social development. In conditions of the scientific-technical revolution, the comprehensiveness of socialist competition and its purposefulness in meeting challenges to comprehensively increase production efficiency and to more fully utilize qualitative factors of the development of the economy and indoctrination of workers become especially important.

Trade union committees and economic managers must more actively and decisively focus competitors on steadily increasing labor productivity, improving its organization, intensively replacing manual labor by machine labor, improving utilization of existing equipment, conserving material and fuel-energy resources, and increasing the yield from each ruble invested in the economy, as well as accelerating technical re-equipment and comprehensive automation and robotization of production, developing and introducing fundamentally new materials and technological processes, increasing the quality and technical level of output, and reducing periods of development and introduction into production of progressive equipment and technology.

Collectives of scientific-research, design, and planning and technological organizations are called upon to play a special role in this. In leading collectives of scientific-research institutes and design bureaus the practice of concluding contracts on creative cooperation among collectives of related enterprises and organizations, developers and customers, performers and co-performers of scientific and engineering-technical development projects has become increasingly prevalent. There is much to be done here to utilize the know-how for organizing competition at industrial enterprises creatively, to transfer to the sphere of scientific and engineering labor increasingly better, to focus efforts of competitors on accelerating development periods of new equipment and progressive technology and raising its quality, and to unconditionally fulfill scientific topical plans. A number of organizations have developed standards for evaluating the quality of labor of competitors of laboratory and department collectives which are used as a basis for summarizing competition results.

For example, in order to increase the efficiency of socialist competition in the VNIItorgmash [All-Union Scientific Research and Experimental Design Institute of Commercial Machinery], an enterprise standard "Organization of Socialist Competition" was developed. Comprehensive evaluation of the quality of labor, not only of each staff member, but of all the institute's departments is the basis of the new method. The purpose of this method is to evaluate and show the share of the staff member's participation in the department's activities as well as the impact of each person's work on fulfilling the department's plan.

The basis of comprehensive contracts for creative cooperation is a creative link between all related organizations working on a given scientific-technical problem. For example, the contract for creative cooperation among the

VNIItorgmash, the Kiev OKBtorgmash [possibly Commercial Machinery Experimental Design Office], the Sverdlovsk and Leningrad Commercial Machine Building Plants, the Dushanbe Special Design and Technological Office for Machine Building, the Frunze KIP Plant, and the Poltava Planning and Design Technological Institute sets the goal of high quality incorporation of series production of lines for processing commodities and packing and packaging fruit and vegetable output. Within the confines of creative cooperation among organizations and enterprises interested in increasing the quality of manufactured textile-finishing equipment, reducing its materials consumption, and accelerating periods of development and introduction of new equipment, an efficient form of organizing joint work has been developed at the Ivanovo Ivtekmash Textile Machine Building Plant -- comprehensive brigades of scientists, designers, and producers from various departments working under a unified, comprehensive plan, starting with pre-design and even exploratory research and going to delivery of the tested model to series production.

The socialist obligations they have adopted promote mobilization of collectives to raise the efficiency of work. This makes it possible to achieve a mutually coordinated reduction in development times by all related collectives participating in competition according to the "Worker Relay Race" principle.

In formulating socialist obligations and creative plans trade union committees of scientific-research institutes and design buro's and PKTB's [possibly planning and design technological buro] should devote particular attention to solving the main problems of the topical plan, fundamentally increasing the quality and reducing development times of designs of machines and equipment and their manufacturing technology, and utilizing the achievements of science and technology extensively. Public defense of projected plans and obligations should be instituted everywhere.

Trade union committees are obligated to investigate collectives' production activity more deeply and use initiative in developing and strengthening links between developers of new equipment and technology and collectives of manufacturing enterprises and users based on contracts for creative cooperation among related laboratories, departments, shops, and production facilities under the slogan "A Guarantee of Quality -- From the Design to the Article."

There are extensive possibilities in scientific-production associations where scientists, engineers, designers, and workers are organizationally combined in order to perform common tasks. By taking advantage of these possibilities skillfully the leading scientific-production association collectives in the machine building and instrument building sectors will rightly become the ones who bring scientific-technical progress to production.

Reserves for accelerating periods of development and introduction of progressive equipment and technology include the properly organized activity of primary NTO and VOIR organizations. Those organizations where trade union committees focus their work on solving fundamental questions of building new highly efficient equipment and pose practical scientific-technical problems make important contributions toward meeting national economic challenges. Worthy of attention is the active participation of the Mashprom NTO council and the

scientific-technical community of the VNIIEKlprodmas [All-Union Scientific Research and Experimental Design Institute of Food Machinery] in discussing and formulating plans for new equipment and scientific-technical and technical-economic problems and challenges which reflect the institute's production activity. It is no accident that since 1979 all the institute's elaborations have been recommended for the highest quality category after tests of models have been made.

Nonetheless the possibilities of primary NTO and VOIR organizations are by no means being realized to the fullest extent. NTO and VOIR councils are still limited, as a rule, by traditional forms of work, seldom take part in solving initiative problems, and do not always react in a flexible way to difficult-to-solve questions which arise, related to developing progressive equipment and putting it into production. Too few public creative brigades, scientific-production groups, comprehensive creative youth collectives, and public design buro's are being set up.

The duty of trade union committees is to take measures to activate the activities of primary NTO and VOIR organizations, public scientific-research and planning and design groups and brigades, economic analysis buro's, and comprehensive creative youth collectives and to focus them on meeting the practical challenges of scientific-technical progress, increasing quality and efficiency, reducing materials and energy consumption of new equipment and technology, and reducing periods for their development and introduction.

Brigades play an ever-increasing role in accelerating intensification of production. This was convincingly demonstrated in the CPSU Central Committee decree "On the Continued Development and Increase in the Efficiency of the Brigade Form of Organization and Labor Incentive in Industry," as well as in the corresponding USSR Council of Ministers and AUCCTU decree. In the new types of brigades -- comprehensive, composite, and cost accounting brigades -- labor productivity increases more rapidly than in other primary nuclei of the collective, losses of worker time and other resources are reduced, and a spirit of genuine collectivism, mutual high standards, and comradely mutual assistance is maintained.

It should also be noted that successfully introducing progressive equipment and technology into production and using it efficiently is to a great extent determined by the level of the people's general education and occupational training. A definite system of training and retraining personnel and raising their skills has been developed in our sectors. Suffice it to say that every year more than 230,000 machine builders and instrument builders raise their occupational skills through various forms of instruction, and almost 85,000 workers acquire second occupations. However, scientific-technical progress and saturation of production with machine tools, machines, technological equipment, and robotized complexes, and the like make increasingly greater demands on the knowledge of workers, engineers, and specialists. Frequently one can still find cases where expensive, highly productive equipment stands idle because people to work on it were not trained in time. Plans for introducing new equipment are being worked out at all enterprises and, it would seem, that it is these enterprises which must establish plans for training the appropriate

workers and specialists. Nonetheless, this is by no means taking place everywhere and these plans are not coordinated with each other. Therefore trade union committees must monitor the instruction process for workers and the timely incorporation of equipment and technology.

Trade union committees and economic managers must insure uniformity of measures to accelerate scientific-technical progress, improve plan and delivery discipline, and increase labor and production discipline through the practice of organizing socialist competition and active enlistment of all workers in solving urgent questions of production and economic activity and re-equipping of production and in searching for new efficient forms of bringing scientific, engineering, and production activities together. The resolution of the December 1983 Plenum of the CPSU Central Committee also calls upon us to do this.

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ALL-UNION COUNCIL OF SCIENTIFIC-TECHNICAL SOCIETIES CHAIRMAN ON  
MACHINEBUILDING INDUSTRY PROBLEMS

Moscow MASHINOSTROITEL' in Russian No 2, Feb 84 pp 11-12

[Article by V.N. Zhuravlev, chairman of a VSNTD department: "New Equipment  
-- A Concern of the Scientific-Technical Society"]

[Text] The CPSU Central Committee and USSR Council of Ministers decree "On Measures to Accelerate Scientific-Technical Progress in the National Economy" is an important step on the path to realizing the course worked out by the 25th and 26th CPSU Congresses to intensify public production and the resolutions of the November 1982 and June and December 1983 Plenums of the CPSU Central Committee on fundamentally increasing labor productivity based on extensive and accelerated introduction of scientific-technical achievements and progressive experience into practice and combining in reality the advantages of the socialist system with the achievements of the scientific-technical revolution. The decree outlines ways to produce in the near future industrial output whose indicators conform to the best contemporary standards as well as introduce progressive technological processes in order to fundamentally increase, on this basis, labor productivity in the national economy.

The party has posed the challenge to insure the most judicious use of production and scientific-technical potential and to work out a system of organizational, economic, and moral measures which would give incentive to managers, workers, scientists, and designers to update equipment and would make it unprofitable to work in the old way.

All these challenges have found their reflection in the recent 2nd Plenum of the VSNTD [All-Union Council of Scientific-Technical Societies] which discussed the question "On the Participation of Scientific-Technical Societies in Fulfilling the CPSU Central Committee and USSR Council of Ministers Decree 'On Measures to Accelerate Scientific-Technical Progress in the National Economy.'"

Academician A.Yu. Ishlinskiy, VSNTD chairman who presented the report, and other speakers noted that the most important activity of NTO organizations, which combine almost 12 million scientists and specialists in their ranks, is fundamentally improving all work to accelerate scientific-technical progress.

Every year about 400 new articles which by technical level conform to or exceed the best world and domestic models are incorporated into the national economy.

However, among the output produced by industry a large proportion of obsolete articles continues to exist. For example, an evaluation of the technical level of articles under production conducted by the GKNT [State Committee for Science and Technology] with the participation of the scientific-technical community has shown that a significant quantity of equipment which is already in the planning stage does not meet the requirements of the highest quality category.

Things are not going well in the machine tool building industry, the light, food, and household appliance industry, and especially in the agricultural machine building industry. The level of demands being set in newly developed and revised standard specifications continues to arouse serious complaints. Because of this, every year Gosstandart returns some of the plans for state standard specifications and technical conditions to ministries and departments for modification.

Primary NTO organizations in production and scientific-production associations and enterprises and scientific-research, design, planning and design, and technological organizations carry a certain responsibility for this. Therefore the 2nd Plenum of the VSNTU envisioned a whole set of measures to increase the technical level and quality of output.

In the machine building sectors the accountability of both manufacturers and customers for establishing, in technical assignments, technical and economic indicators which are not inferior to the level of the best domestic and foreign models has been increased. Differentiated norms of renewal periods for machine building output are to be developed.

Beginning in 1984 standard specifications will be developed which take account of interrelated demands for technical and economic indicators of machines, equipment, instruments, raw and processed materials, and assembly components, keeping in mind that these demands must exceed the level achieved and conform to the future world level of engineering and technology. In addition, certification of industrial output by two quality categories -- highest and first -- is being introduced starting in 1984. Industrial output which is not certified as either highest or first quality category is subject to withdrawal from production.

It should be noted that NTO organizations have already accumulated a certain amount of experience in conducting expert appraisal of the technical level of output under production.

For example, as a result of careful analysis the scientific-technical community in Kuybyshev Oblast uncovered fundamental shortcomings in the design and technological process of manufacturing stackers and stack trucks being produced by the Syzran'sel'mash Plant. In order to improve the technological processes of manufacturing agricultural machinery and increase its reliability, a plan for joint creative work by sections of the plant NTO and oblast board of directors of the machine building industry NTO has been developed and put into practice.

NTO organizations have positive experience in public expert appraisal of plans and experimental models of machines and industrial equipment.

For example, the VSNTTO committee on problems of quality, reliability, and standardization together with Gosstandart Scientific and Technical Council sections conducted an appraisal of Don combine models. On the basis of its results recommendations to increase the reliability of these combines were developed and sent to interested ministries and departments.

NTO organizations must increase work on conducting public expert appraisals of plans for machines, equipment, and instruments, disseminate the principles of certification in the development stage of output as well, and most importantly, work out practical recommendations and precise engineering decisions and put them into practice.

The adopted decree envisions working out the main directions for further expansion and deepening of intersectorial specialization and production cooperation in the machine building industry in 1986-1990 and for the period till the year 2000 on the basis of maximal standardization of assemblies and parts. These directions will include measures to optimize standard sizes of machines, equipment, and instruments and develop standardized modular-block and base designs. NTO organizations, above all in the machine building industry, must take a most active part in this work. Contests for better work on standardization and aggregating should be organized.

In order to represent the amount of work facing the machine building industry in the near future, including that facing the scientific-technical community, it should be noted that merely to fulfill the Food Program for 10 years the countryside must be supplied with 3,740,000-3,780,000 tractors of increased reliability, more than 3 million trucks, about 200,000 excavators, 1,170,000 harvesters, and other equipment.

It should be noted that the development of the machine building industry is unthinkable without automating and introducing new technology and new methods of designing everything new that science offers us today. Unfortunately, it must be acknowledged that we are not as yet taking full advantage of the potential of local scientific-technical societies to carry out a uniform technical policy of machine building industry automation.

However, there are a number of positive examples in the sector. For example, the Donetsk Oblast NTO Board of Directors regularly conducts a scientific-practical seminar for chief engineers of machine building enterprises where questions of determining the economic advisability and technical possibilities of automating machine building production in oblast plants are reviewed. In Dnepropetrovsk a survey has been conducted with the help of the scientific-technical community to evaluate the reliability of equipment at machine building enterprises. Practical proposals, including a proposal to build seven robotized sections in the city's machine building plants, were a result of the survey.

Automated machine building processes must be introduced above all in medium-series production, which produces about 40 percent of all machine building output. It is impossible to meet these enormous challenges without the active assistance and direct participation of the scientific-technical community. Therefore, progressive experience in reducing manual labor already accumulated in many primary NTO organizations must be disseminated everywhere.

The principle "Before mechanizing an operation, an attempt must be made to eliminate it" is absolutely correct, since this may be implemented by organizational and technical measures also. This principle is applied extensively in the Uralmash Production Association. More than 1,000 of the nation's enterprises now support the initiative of the Uralmash Production Association scientific and technical personnel. The work of millions of NTO members in this direction can be of invaluable benefit to the national economy. Thanks to the purposeful work of the Moldavian Republic NTO Council, the initiative of the Uralmash Production Association is supported by 100 primary NTO organizations in the republic. As a result in the Tiraspol Casting Machine Plant imeni S.M. Kirov, 156 people have been temporarily liberated; this amounted to a 971,000 ruble savings.

The plenum devoted much attention to questions of intensifying propaganda on the achievements of science and engineering and disseminating progressive know-how. NTO organizations have at their disposal everything necessary to handle this task successfully. And in order to perform it successfully they must rely on the following principles which should be the basis for all work on propaganda: the paramount principles are timeliness, efficiency, purposefulness, and comprehensiveness.

The plenum adopted a decree and a plan for measures to meet challenges stemming from the CPSU Central Committee and USSR Council of Ministers decree "On Measures to Accelerate Scientific-Technical Progress in the National Economy."

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#### UNITY OF SUBDIVISIONS OF SCIENTIFIC ASSOCIATIONS URGED

Leningrad VESTNIK LENINGRADSKOGO UNIVERSITETA: EKONOMIKA, FILOSOFIYA, PRAVO in Russian No 23, Issue 4, 1983 (manuscript received 11 May 83) pp 25-27

/Article by P. A. Rodionenkov: "Economic Unity of Subdivisions of Scientific Production Associations as a Condition for Intensification of the 'Research-Production' Process"/

/Text/ An acceleration of the realization of the results of research and development and an increase in their efficiency depend to a significant extent on the integration of science and production, that is, the development of forms of cooperation of the links connecting them that create a single, integral system. The combination of science and production ensures the optimum materialization of scientific ideas--their embodiment in production with the greatest national economic effect and during the shortest period.

Diverse organizational forms have emerged and become widespread in our country at the stage of developed socialism. By means of these forms scientific and production subdivisions are unified into a single process for the development and introduction of scientific and technical achievements into public production. The establishment of scientific production associations is one of them. They can include, depending on the problems being solved, scientific research institutes, planning-design and technological organizations and contract supervision and other structural units. They are called upon to perform the role of the scientific and technical centers of a sector or subsector in the specialization assigned to them. Their task is to develop the most important directions in equipment and technology ensuring the creation of the necessary scientific reserve for a rise in the technical level of the appropriate area of production.

Practical work shows that with the establishment of scientific production associations the length of the process of development and mastering of models of new equipment has decreased to two-thirds or one-third. The scientific and technical level of output has risen. As a rule, it corresponds to the best world and domestic models and in its majority has the State Badge of Quality. Nevertheless, the organizational factor, despite its importance, is only the first step in the strengthening of the relations of science with production. Their economic unity is necessary.

The practical experience of various scientific production associations shows that under present conditions planning, financing, material stimulation and so forth, basically, are carried out independently for scientific and production subdivisions. The evaluation of their activity is also made separately. This leads to the fact that in their majority scientific research structural units operate independently of the results of introduction of their own scientific and technical achievements into material production. Under the existing practice of evaluation of activity the volume of expenditures in rubles for the performed operations is the economic result for them. Moreover, in some scientific production associations scientific and production subdivisions are on an independent balance. This indicates that the unification of the elements of the "research-production" process has occurred, but socialization in the broad sense and, primarily, of production relations has not yet been realized.

The solution of this problem is based on the realization of the decree (July 1979) for improvement of the economic mechanism, in particular of the system of planning, financing and material incentives in the structural subdivisions of scientific production associations, adopted by the CPSU Central Committee and the USSR Council of Ministers. First of all, it is necessary to establish a single all-around system of planning the "research-production" process. An extensive introduction of this new form of planning is hampered by the fact that the specific nature of functioning of this single integral complex is not taken into consideration sufficiently on the part of planning and economic bodies.

The transition to a purposeful overall planning of the introduction of scientific and technical achievements is a big potential for an increase in the efficiency of operation of scientific production associations. The practical work of associations, in particular in the electrical engineering industry, where the "research-production" process functions on the basis of single all-around schedule-orders, attests to this. This has made it possible to accelerate developments and to concentrate financial and material resources on the most important directions in scientific and technical progress in the sector.

To attain the economic unity of the scientific and production subdivisions of scientific production associations, the expenditures on applied research and development should be included in the production costs of appropriate products at the level of associations or industrial sectors. Such a practice exists in a number of socialist countries, in particular in the GDR.

The inclusion of expenditures on production research and development in the production costs of a material product presupposes the inclusion of scientific and technical personnel in the aggregate productive worker. Of course, this involves a change in the planning and accounting practice of some economic indicators of the work of scientific production associations, primarily of labor productivity.

Planning and statistical bodies do not allow this, because a formal decrease in labor productivity will occur, since during its calculation the fraction denominator (sold commodity output or standard-net output divided by the number of industrial and production personnel) will be increased. However, real

labor productivity, naturally, will not change, because the sum of use values does not decrease and society does not lose a single product unit. Moreover, when expenditures on research and development are taken into account in the cost of a product, the inclusion of a worker of applied science in industrial and production personnel will increase the cost of gross output accordingly. In any case one out of presently recognized indicators (gross output) will be increased and equal fractions will appear in the denominator and numerator, not changing the indicator of productivity, because it is measured on a value scale.

The actual productivity not only does not suffer, but gains greatly, from the utilization of the mentioned economic mechanism. The possibility of saving not only labor in material public production, but scientific labor itself, is created here. In practice, although the concept of productivity has begun to be applied to scientific labor, it remains not meaningful economically in this sphere. If science becomes a direct productive force, the results of this labor as such (knowledge, information and new prices) can be represented as goods and value created by science and this means that science itself creates exchange value outside material production. In this case scientific research institutes and planning-design divisions can exist and develop as a result of the sale of their output and on this basis build economic relations on self-repayment principles.

However, we must clearly realize that the function of science as of a productive force is performed when scientific labor appears as an integral part of all aggregate productive labor utilized in material production. The concept of productive labor is inapplicable to separately taken scientific labor, because the latter in itself can produce only spiritual values, that is, projects, information and so forth. In combination with physical labor forming part of the entire aggregate productive worker scientific labor is realized in the produced material product in the form of higher use value.

It is also necessary to solve the problem of creation of a single material incentive fund of scientific production associations for all the structural subdivisions--scientific and production--forming part of it. The capital of this fund should be assigned for awarding bonuses to all participants, primarily for the end results of activity of scientific production associations, which scientific research and development realized in material production are. At the same time, it is necessary to also take into consideration the specific nature of work performed by specific subdivisions and their place in the division of labor in the "research-production" process, as well as the characteristic and to a certain extent independence of the stages of this process. The realization of these proposals will make it possible in large measure to increase the efficiency of functioning of scientific production associations.

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## INTEGRATED PROGRAMS FOR DEVELOPMENT OF SCIENCE AND TECHNOLOGY IN GEORGIAN SSR

Tbilisi ZARYA VOSTOKA in Russian 15 Mar 83 p 2

[Article by Archil Dzidziguri, chairman of the Commission for the Study of Productive Forces and Natural Resources under the Presidium of the Georgian Academy of Sciences and academician of the Georgian Academy of Sciences, and Otar Paresishvili, chief of Department of Future Research of that commission, candidate of chemical sciences: "Combined Solutions"]

[Text] A wide range of issues is covered in the decree of the CPSU Central Committee and USSR Council of Ministers, "Steps for acceleration of scientific and technological progress in the national economy," from global ones pertaining to improvement of the system of implementing a unified scientific and technological policy to tasks put to different ministries, agencies and organizations. They cannot be implemented without upgrading control of scientific and technological progress (NTP).

It is valid to pose the question of opportunities that exist for this. First of all, implementation of the integrated program for scientific and technological progress in the USSR and different regions is an element of long-term planning, one of the most important preplanning documents. The USSR Academy of Sciences, USSR Committee for Science and Technology and USSR Gosstroy have been instructed to regularly develop the integrated NTP program for a 20-year period (in 5-year parts) and submit it to the USSR Council of Ministers and Gosplan no later than 2 years prior to the next Five-Year Plan. By decision of superior bodies, integrated programs of NTP have been developed in Union republics and major economic regions since the 11th Five-Year Plan. In Georgia, work has already been completed on preparing the first of such programs, which covers the period 1986-2005. It was developed under the supervision of the Republic Scientific Council for Problems of Scientific-technological and Socioeconomical Forecasting (RNSP) of the Georgian Academy of Sciences, Georgian State Committee for Science and Technology and Georgian Gosplan. The following are the chief organizations for such development: Commission for the Study of Productive Forces and Natural Resources (KEPS) under the presidium of the Georgian Academy of Sciences, Institute of Economics, Planning and Control of the National Economy under this republic's Gosplan, Institute of Economics and Law of the Georgian Academy of Sciences. A total of 23 problem commissions participated in preparing the program, as well as most ministries, agencies, leading institutes and organizations in this

republic. The integrated program for NTP in Georgia is a regional part of the integrated program for USSR NTP, and it contains forecasts of basic directions of development of science, scientific and technological progress in the national economy, a forecast of socioeconomic conditions and possible implications of introducing the achievements of science and technology to the practice of the national economy.

Considering the fact that this program covers a wide range of issues, it is deemed expedient to dwell only on the most important national economic problems of NTP that are to be solved in the period covered by the forecast.

Georgia has diverse valuable mineral raw materials, unique agricultural, water and recreational resources. Problems related to wise and combined development of manganese, petroleum, coal, copper, lead, talcum, barite and other mines are of special importance to our republic. For expressly this reason, the basic directions of NTP in this area are further increase in resource potential of the most important types of mineral raw materials, significant increase in level of concentration and intensification of work in mines, deposits, quarries, concentration factories and processing enterprises.

While the territories of western and eastern Georgia are about the same in area, about 75% of the water run-off is referable to West Georgia. A water shortage is anticipated in the summertime, starting in 1990, in East Georgia. For this reason, comprehensive investigation of variants of redistribution of water resources is a rather important issue. The main task here should be in-depth investigation of ecological changes in the environment, development of technical solutions, etc. NTP in the area of wise utilization of water resources involves the following: refinement of method of irrigating land, sprinkling systems and their automation, refinement of water supply systems, expansion of network of piped water for industrial and drinking purposes. Broad introduction is necessary of systems of recycled use of water, starting up efficient installations for treatment of liquid sewage, etc.

The fuel and energy complex (TEK) of Georgian SSR is characterized by an increasing shortage of electricity and fuel. In spite of the growth in production of electricity, this republic is regularly experiencing a shortage, particularly in the fall and winter. Yet Georgia has considerable unused hydraulic power resources. For this reason, in the forecast period it will be necessary to further develop the network of hydroelectric stations, both on large and medium, as well as small rivers of this republic, including water-storing electric stations. Construction of a basic electric power station is a cardinal solution to eliminate the shortage of electric power.

The coal and petroleum recovered in this republic cover only 20% of the requirements of the Georgian national economy. Yet there are stocks of organic fuel in the republic. At the present time and in the future, the coal requirements exceed its mining. To improve the efficiency of the republic's coal industry, it is necessary to effect a radical reconstruction and updating of existing mines and concentration plants, with increase in their production capacities, as well as to undertake construction of a large new mine at the Tkibuli-Shaorskiy deposit.

Machine building and metal working are in one of the leading places in the structure of Georgian industry. The main direction of development of machine building in the future is to increase the role of its subsectors that do not involve increased use of metals, but increased use of science, which are relatively labor-consuming, i.e., electronics and instrument building.

There are plans to develop and introduce in instrument building some new instruments and automation equipment on the basis of microelectronic technology. In the area of development of production of analytical instruments--development and introduction of a microprocessor system on an microelement basis, monoselective analytical technology.

In the area of development of computer equipment, there are plans to turn from integral microprocessor circuits to superfast systems (SSIS) and memory systems, as well as to develop specialized control computer complexes (UVK), equipment for communicating with an object (USO) and logical robots based on programmable monitors, microcomputers and micromonitors, adjustable homogeneous structures, etc.

The specific distinctions of the republic's agroindustrial complex (APK) make it necessary to develop and refine the set of equipment for mountain farming and small-scale mechanization of agricultural work, equipment for gathering, transporting, waste-free processing and storage of tea, grapes, citrus fruit, other subtropical and southern agricultural, fruit and vegetable crops.

In the area of this republic's metallurgy, the main directions of NTP are related to refinement of technology for producing manganese ferroalloys at the Zestafoni Plant, further development of powder metallurgy, recovery of coke from the coal field of Tkibuli-Shaorskiy, change to coke-free metallurgy, introduction of technology for the hydrometallurgical method of obtaining metal copper with use of copper ore of Madneulsk and manganese of Chiatura. It is quite important to introduce in the future a waste-free technology for processes at the Zestafoni Ferroalloy Plant in order to switch to a closed production cycle completely by 1990.

There will be further development of the construction complex in this republic over the forecast period.

The main directions of NTP in the agroindustrial complex of Georgian SSR call for further development of sectors that process agricultural products, improvement of technology and equipment to augment harvests, increase output, waste-free processing, storage and improvement of quality of tea, citrus fruit, grapes, fruit, vegetables and other southern and subtropical, etc., crops, solving the problem of programming the harvest. Questions of upgrading technology and equipment for growth of the feed base also hold an important place.

Production of consumer goods, public catering network and personal services should be further developed in the forecast period.

The question of improving transport communication and equipment is particularly important to Georgia, considering the significant development of the national

economy, complexity and broken nature of its topography. The chief NTP problems in this area are: development and introduction of optimum system for combining and controlling various types of transport to improve the efficiency of freight hauling in the national economy of this republic; solving problems related to construction of the Caucasian Mountain Pass Railroad; development and broad introduction of efficient systems of special types of transport--cable-driven, pipe and conveyer.

The complicated correlations in different sectors of the Georgian national economy make it necessary to solve problems of development of a republic automated system for control of the national economy--RASU "Georgia"--and develop, update and improve the quality of all types of communication systems and information services.

The significant growth of physical production in this republic over the forecast period makes it necessary to develop purposeful and scientifically validated decisions dealing with placement of productive forces and improvement of production technology with due consideration of ecological impact.

It is necessary to prepare a deterioration register of Georgian SSR in order to solve ecological problems in this republic. It is important to define the ecological features of regions within the republic, namely, demographic capacity, reproductive capacity and geochemical activity of the territory. It is also necessary to make expert ecological evaluations of national economic plans and forecasts dealing with development and placement of productive forces. Introduction of automated systems for monitoring environmental pollution is acquiring special meaning.

In his speech before the elections, comrade K. U. Chernenko, general secretary of the CPSU Central Committee, stated: "It is necessary for there to be an increase in each republic's ability to make an effective contribution to the economy of the Soviet Union as an integral national economic complex." The integrated NTP program is an effective means of meeting the party's demands; as it was stressed at the June, December (1983) and February (1984) plenums of the CPSU Central Committee and 6th Plenum of the Georgian CP Central Committee, fulfillment of this program depends on the efforts of scientific and industrial elements, ministries, agencies and institutions armed with the strategy and tactics that will be instrumental in growth of the economy and social development of the nation, including Georgian SSR.

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UPDATE ON EFFORTS AIMED AT DEVELOPMENT OF SCIENCE AND ACCELERATION OF  
SCIENTIFIC AND TECHNOLOGICAL PROGRESS IN GEORGIAN SSR

Tbilisi ZARYA VOSTOKA in Russian 28 Mar 84 pp 1-2

[Article filed by GruzINFORM (Georgian Information Service): "To Reinforce  
Achievements and Make Plans for the Future"]

[Text] In the 2 years that have elapsed since the 6th Plenum of the Georgia Communist Party Central Committee, this republic's system for control of science and scientific-technological progress has undergone major and serious changes; it was reinforced with new elements, has become more effective and efficient, and the leading role in this was played by the republic's coordinating council for science and scientific-technological progress, which is headed by E. A. Shevardnadze, first secretary of the Georgian Communist Party Central Committee and candidate for membership in the Politburo of the CPSU Central Committee. This council has become the chief organizer of implementation of the plenum's decisions, the chief coordinator in concentrating efforts on development of science, acceleration of scientific and technological progress.

At an enlarged session of this council, which convened in the Central Committee of the Georgian Communist Party, it was noted that the council is constantly finding optimum forms and methods of working.

The meeting summed up the achievements of ministries, agencies, associations and enterprises with regard to acceleration of scientific and technological progress last year, and it outlined the tasks for this year. In addition to members of the Republic Coordinating Council, chiefs of its sections and working groups, the participants in this session included chairmen of regional coordinating councils for science and scientific-technological progress of this republic's industrial centers, chiefs of technical administrations of ministries and agencies, chief engineers and chief technologists of major enterprises and associations, administrators of scientific research, planning-design and technological organizations.

Ye. K. Kharadze, president of the Georgian Academy of Sciences, I. S. Zhordaniya, deputy chairman of the Gosplan, P. S. Dugashvili, deputy chairman of the Georgian GKNT [State Committee for Science and Technology], G. Z. Mirianashvili, chairman

of this republic's Gosstroy and L. M. Datiashvili, first secretary of the Rustavi gorkom delivered information about the work done in 1983 by the republic's Academy of Sciences, Georgian Gosplan, Georgian GKNT, this republic's Gosstroy and Rustavi gorkom.

The council heard the report of O. G. Vardzelashvili, deputy chairman of the Georgian Council of Ministers, concerning steps to organize production of chelates for control of diseases and pests of agricultural plants.

E. P. Kemertelidze, director of the Institute of Pharmacochimistry, Georgian Academy of Sciences and corresponding member of this academy, reported on introduction of production of drugs from papaya trees at the institute that he heads.

V. I. Bakhutashvili, deputy director of the Institute of Experimental Morphology, Georgian Academy of Sciences, and corresponding member of this academy, reported on the status of work to develop and investigate a new type of human interferon and prospects of producing it.

Comrade E. A. Shevardnadze delivered a speech at the meeting of the council.

The speakers noted that, last year, this republic achieved high indicators in the economy, coming up to the mean Union level of national income per capita. There has been growth in the republic's share in the unified national economic complex of our country. In this respect, an important part is attributable to new types of production and new progressive technological processes, output and assimilation of which were listed in the plan for development of science and technology. Last year, associations and enterprises implemented more than 1000 measures referable to this plan, and their economic impact constituted about 90 million rubles.

One of the most important achievements mentioned at the meeting, with regard to fulfilling the decisions of the 6th Plenum, were the high indicators for fulfillment of plans for new equipment in 1983.

The tasks for administrators of the Gosplan, ministries and agencies, associations and enterprises of this republic are to strengthen and develop what has been achieved, assure definite fulfillment of tasks pertaining to new equipment this year. The decree adopted by the CPSU Central Committee and USSR Council of Ministers, "Steps to Accelerate Scientific and Technological Progress in the National Economy," mentions fulfillment of plans and assignments dealing with development of science and technology among the most important indicators, on the basis of which primary evaluation is made of results of economic endeavors of production associations and enterprises, and the results of socialist competition are summed up.

In this respect, it was stressed by the speakers, it is necessary, first of all, to learn how to prepare plans of high quality for development of science and technology and, in the second place, to learn how to fulfill them. A plan must be rather intensive, on the one hand, and of necessity realistic, on the other. The job of developing well all of its sections and then of definitely fulfilling them pertains to each administrator, since a plan for

development of science and technology with all its sections must become the principal and effective state tool for implementing the party's indications concerning acceleration of scientific and technological progress in the national economy.

It was noted at the council's meeting that perceptible positive changes have taken place in the performance of this republic's Gosplan after the new equipment service under it was expanded. At the same time, it was indicated that there is a need to activate the activities of the entire apparatus of the committee in forming plans for development of science, introducing new equipment and improving work in this direction.

The council gave its approval to measures for further improvement of control systems for medical and agricultural science and introduction of advances of scientific and technological progress to practical public health and agricultural production in the republic.

The republic's Academy of Sciences, Georgian GKNT and many higher educational establishments activated their work.

There was mention, in particular, of some interesting innovations in the system of the Georgian Academy of Sciences: sectors were established for mathematical analysis of sciences and sociology of science, partnership and introduction of results of scientific research. A new form of collaboration between this republic's Ministry of Finance and Academy of Sciences in the area of accelerating scientific-technological, economic and sociocultural progress.

The State Committee for Labor, Gosstab, Central Statistical Administration and Georgian Republic Gosstandart Administration play a rather important part in accelerating scientific and technological progress. However, for the time being they are not sufficiently concerned about the sizable work being done in this direction in this republic. There must be activation as well of sectorial ministries and their scientific-technical councils. They must always bear in mind that they have been made responsible for broad and effective introduction to subordinate associations and enterprises of the advances in science and technology, for improving the technical level of production.

The council meeting focused attention on flaws and unsolved problems. In particular, it was indicated to the State Committee for Agricultural Production, ispolkom of the Karelskiy Rayon Council of People's Deputies, as well as this republic's Ministry of Local Industry that passivity is inadmissible in organizing production of chelates developed by Georgian chemists.

After the 6th Plenum, an interesting form developed in our republic of improving party management of science, scientific and technological progress. The Republic Council approved of the performance of regional coordinating councils for scientific and technological progress under the Kutaisi, Sukhumi, Poti, Rustavi gorkoms, Dushetskiy, Khobskiy and Mtskhetskiy raykoms of the party.

It was stressed that regional councils play an important role in augmenting the scope of all work to accelerate scientific and technological progress. However, they still do not exist officially under many raykoms and gorkoms.

The council meeting commented on the active and fruitful work of the Institute of Pharmacochimistry imeni Kutateladze of this republic's Academy of Sciences in developing new drugs from papain recovered from domestic raw materials. It was recommended that full cooperation be rendered to scientists in establishing the appropriate raw materials base and production of the agent.

The council voiced its approval of the work dealing with development and investigation of a new type of human interferon. Considering the fact that the first clinical trials of this agent yielded positive results, it was deemed expedient to settle the question of experimental production of experimental specimens of this agent at the relevant laboratory of the Institute of Experimental Morphology, Georgian Academy of Sciences.

The council approved of the draft of a statute concerning a republic-level coordinating council for science, scientific and technological progress.

Comrades G. A. Andronikashvili, G. D. Gabuniya, D. I. Patiashvili, S. Ye. Khabeishvili, O. Ye. Cherkeziya, Z. A. Chkheidze and Zh. K. Shartava participated in the council meeting.

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## SCIENTIFIC CONTRIBUTION OF KAZAKHSTAN TO USSR ECONOMIC DEVELOPMENT

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 15 Apr 84 p 4

[Article by M. Sergeychik: "On the Basis of Business-Like Collaboration"]

[Text] In our times, science determines in many respects the routes and achievements in development of the economy. This is logical: we live in a time of scientific and technological revolution, when the road is being drastically shortened for inventions, from research laboratories to industrial enterprises, and in essence science is merging with industry. The idea formulated more than 100 years ago by Karl Marx of converting science into a productive force has become the reality of well-developed socialism.

At the same time, however, there is also an increase in science's responsibility to society under these conditions. It is not by chance that it is straightforwardly stated in the proceedings of the 26th CPSU Congress: "The nation is in great need for the efforts of "big science" to concentrate more on solving key problems of the national economy, inventions capable of making truly revolutionary changes in industry, along with its development of theoretical problems.

How are these requirements being met by Kazakh scientists? This question began our conversation with Academician A. M. Kunayev, president of the Kazakh Academy of Sciences.

[Answer] One of the main advantages of socialist economy is that planning is also being used to a full extent in development of Soviet science, and this is what provides its leading frontiers in the world.

The scientific and technological revolution under socialism offers not only vast opportunities for radical transformation of production methods, development of basically new and highly productive work tools, progressive materials, emergence of new industrial sectors, but unprecedented conditions for comprehensive development of man himself and for increasing the efficiency of all industrial endeavors.

These theses are convincingly illustrated by the remarkable economic achievements of Kazakhstan, which also contain some contribution by our scientists.

For example, last year alone, institutions of the Academy of Sciences introduced 193 scientific recommendations to practice. The largest number of such recommendations were used in ferrous and nonferrous metallurgy, agriculture, the chemical industry and capital construction.

Here are some examples of truly business-like and creative collaboration between scientists and industrial workers. The group of the Institute of Chemistry and Metallurgy at the Karaganda Metallurgical Combine have set up the technology for production of sinter from a mixture of magnetic gravity and magnetic calcination concentrate at the Lisakovsk Mineral Concentration Combine. The scientists' research made it possible to augment sintering machine productivity and obtain a significant economic effect. As a result of the research done at the same institute, secondary processing of previously "lost" ore stock has been performed at the Leninogorsk Complex Ore Combine. Thus a large amount of raw materials was put to use.

Industrial waste from enterprises in Rudnyy Altay is being used with success as microfertilizer on the fields of kolkhozes and sovkhoses in Semipalatinsk Oblast on the basis of recommendations of the staff at the Institute of Geological Sciences imeni K. I. Satpayev. This resulted in a larger harvest of agricultural crops and a saving of about 2 million rubles.

Of course, we could cite quite a few such examples. All of the institutions under the Academy of Sciences introduced to production diverse effective recommendations, new practical developments of technological processes, modern designs of machinery and equipment. Sizable advances have been made in this direction by the personnel of the Institute of Metallurgy and Concentration, Institute of Chemistry of Petroleum and Natural Salts, Institute of Organic Catalysis and Electrochemistry, Institute of Experimental Biology and many others.

In recent years, a method has been refined for collaboration between Academy institutes and sectorial ministries of this republic. In particular, we have prepared and submitted to the ministries of agriculture and fruit and vegetable growing, ferrous metallurgy and the meat and dairy industry a list of completed investigations of practical interest to enterprises and farms in these sectors. In turn, these agencies informed us about the most serious production problems that require participation of scientists. Together we defined the base enterprises and farms for experimental production testing of the scientific developments of Academy institutes.

It should also be stated that scientists of VUZ's, the staff of agency-level scientific research and planning-design institutions are also making a rather large contribution to development of science and introduction of its achievements to practice. In this respect, the instructors and students at the Kazakh State University imeni S. M. Kirov, Karaganda and Kazakh polytechnical institutes are outstanding. Thus, the scientists of the Kazakh State University introduced at the start of the current Five-Year Plan 129 developments to the national economy of our country, with an economic impact in excess of 22 million rubles; 15 patents and 150 author certificates have been received. You will agree that this is a rather substantial practical asset of VUZ scientists.

[Question] It was stated, in the report of comrade K. U. Chernenko to the June (1983) Plenum of the CPSU Central Committee, in particular: "... Scientists must address themselves more to the future and promptly 'detect' emerging trends. I am referring to reliable forecasting, which would make it possible to have a better view of the future and make validated decisions." What are the scientists of our republic doing in this respect?

[Answer] The Soviet nation has graphically proved the advantages of the programmed-goal approach to solving major intersector scientific and technical problems. Use of atomic energy for peaceful purposes or space exploration are examples. This thesis is stressed with new force in the decree of the CPSU Central Committee and USSR Council of Ministers, "Steps to accelerate scientific and technological progress in the national economy." Scientific institutions were given responsible tasks that are related to this. Their goal is to increase the impact of scientific research, be helpful in introduction of scientific achievements in all areas, concentrate the scientific potential on meeting both the present and future needs of the economy.

Our institutions displayed a very responsible attitude in performing these tasks. Even now, the basic directions of scientific and technological progress in this republic up to 2005 have already been developed. They call for comprehensive intensification of social production, wise use of manpower and physical resources, improvement of quality of performance of all sectors of the national economy. The goal is to succeed in solving economic and social problems, as well as improve the welfare of the people.

At the same time, Academy institutes are conducting research on future placement of productive forces and problems of economic development of regions, improvement of theory and methodology of economic planning, socioeconomic aspects of optimum use of natural resources and environmental protection, and many other topics. For example, last year alone, research was conducted that dealt with 17 combined scientific and scientific-technological programs. A large volume of work was accomplished in the light of the requirements of the Food and Energy Programs, and other problems. For example, the integrated program for "Use of secondary resources and industrial waste in the period up to the year 2000" is of considerable interest.

[Question] Askar Minliakhmedovich, socialist competition for overfulfillment of plans to augment labor productivity by 1% and additionally lower production costs by 0.5% has been deployed among the worker groups of this republic. Of course, it is the direct and immediate duty of our scientists to accomplish these tasks.

[Answer] Unquestionably. It would be difficult to exaggerate the role of scientific institutions in the matter of intensification of production. It would be simply impossible to solve the responsible problems of today without the latest equipment and progressive technology. And it is expressly on this basis that labor productivity can and must increase.

The principal route toward achievement of this goal is to change to intensive development, uniting the advantages of our socialist system with the achievements of the scientific and technological revolution. And this requires

acceleration of development of progressive machinery, devices and technology, more active automation of production, broader use of computers and industrial robots. It is very important not only to develop new equipment and technology according to plan, but to implement faster on this basis the retooling of industry.

Scientific institutions of this republic have achieved quite a bit in this direction. Thus, on the basis of economic agreements alone with industrial enterprises, the staff of Academy institutes annually conduct various research constituting in excess of 10 million rubles. This research is directed, as a rule, toward upgrading scientific organization of labor and technology, setting standards, improving product quality and other factors that ultimately form growth of labor productivity.

We see here today a wide area of activity for each of our institutions. For example, the work of the Mining Institute merits praise. Its staff introduced to the Tekeli Lead and Zinc Combine a progressive system for processing ore with hardening loading and use of self-propelled equipment. The result was a reduction in volume of ore-preparing work and increase in labor productivity of miners by more than 2 times. A section of the mine was started up considerably earlier than the target date.

Literally every associate of any scientific institutions can find application for his capacities and knowledge in the matter of augmenting labor productivity and lowering production costs. Let us take, for example, the problem of reducing manual labor or waste-free technology. It is important to plan such work competently, provide strict control over its performance and act together with the workers of enterprises, construction sites, kolkhozes and sovkhoses. In such a case, success is assured.

[Question] At the start of our talk, we discussed collaboration between scientists and industrial workers. But there is also collaboration with scientific institutions of other republics and countries....

[Answer] Yes, such collaboration with foreign scientists and staff of academies of sciences of Union republics is strengthening and developing from year to year. Suffice it to mention that, in 1983 alone, there were 11 international and All-Union symposiums, conferences and meetings in Kazakhstan. They included an international conference on use of the Mossbauer effect, attended by about 400 scientists from 10 countries, including R. Mossbauer, recipient of the Nobel Prize, All-Union symposiums on the results of studies of the middle atmosphere and removal of metal from petroleum and petroleum products, an All-Union conference on catalytic reactions in the liquid phase and many others. This in itself is already indicative of the high authority of Kazakh science in our country and abroad.

Many of our scientists have made a contribution to the "bank" of this authority. Last year, they received 546 author certificates and approval for issuing them. The economic impact of introducing to the nation's economy the inventions of scientists of the Kazakh Academy of Sciences constituted 42 million rubles in 1 year.

Of course, such developments are also drawing attention abroad. At the same time, joint research is also being pursued. We have established friendly and business-like relations with scientific institutions in the GDR, Czechoslovakia, Poland, Mongolia and other socialist countries, as well as various international scientific organizations.

[Question] It is logical to pose today the question of organizational and material-technical development of Academy institutions and their plans for the future.

[Answer] Like any economic department, the Academy of Sciences cannot solve the problems put to it without planned development and refinement of its structure, strengthening of the material and technical base. What have we done in this area? Last year, four new institutes were opened: of molecular biology and biochemistry, geography, the ionosphere, organic synthesis and coal chemistry. The last mentioned institute was opened in Karaganda, where the Central Kazakhstan department of our Academy of Sciences was organized concurrently. The purpose of these steps is to concentrate the efforts of scientists in more concrete directions of research, to bring their work closer to industry.

This is also expressed in our plans: along with basic research, to offer as many recommendations and proposals as possible to the national economy for intensification of production, increased labor productivity, for being more economical and conservative, particularly in utilization of secondary heat and fuel, coal-processing waste, waste from chemistry and petroleum processing, metal slag and ash from heat and electric power stations.

Responsible tasks have been formulated in the decisions of the February and April (1984) plenums of the CPSU Central Committee and speeches of comrade K. U. Chernenko, pertaining to further development of the economy and culture of our country. Soviet scientists view their present duty as offering a maximum contribution to implementation of these tasks.

#### Activities in Scientists' Laboratories--in Celebration of Day of Soviet Science

As one makes a tour of the laboratories of the Institute of Chemical Sciences, one hears more than scientific terms. Figures will also be quoted that express the effectiveness of the work of scientists. Series production of electric dialysis and desalinization units of a new design has been set up at the Alma-Ata Electromechanical Plant, which were developed at this institute. The economic impact from using them constituted over 4 million rubles in 1983.

Work on development of new growth regulators for agricultural crops, AYe and ASA growth stimulators have increased vegetable harvest by 20-25% in trials. A savings of about 800,000 rubles has been realized since the start of their use last year. A technology for production of ferrophosphorus of an improved grade has been adopted at the Dzhambul Khimprom [chemical industry] Production Association under the USSR Ministry of Fertilizers, with an economic impact of half a million rubles. Output of fireproof polymers at the Alma-Ata Household Chemical Products Plant yielded another 3 millions of profit last year alone.

Last year, a total of 36 topics of utmost importance to the national economy were investigated in the laboratories, and 9 developments were passed on to industry.

Of great interest to the economy of this republic and the nation, among the latest scientific innovations proposed for introduction, for example, by the rare-element laboratory, are polymer phosphorus fertilizers and an essentially new, economically advantageous technology for producing them.

Recently, the Institute "Order of Red Banner of Labor" of Chemical Sciences, Kazakh Academy of sciences, was recently awarded the challenge Red Banner of the Presidium of the USSR Academy of Sciences and Central Committee of the trade-union of workers in education, higher educational establishments and scientific institutions for achievements in development of chemical sciences and training highly qualified personnel. The chemists of Kazakhstan are ahead in the All-Union socialist competition among personnel of scientific institutions of our country, and they will try to confirm the title of leaders with new scientific achievements.

#### PHOTO CAPTIONS

- p 4 (left) In the Rare-Element Laboratory: G. P. REVENKO, graduate engineer, D. V. SOKOLOV, doctor of chemical sciences, Zh. S. ISIN and K. D. PRALIYEV, candidates of chemical sciences
- p 4 (right) In the Organic Synthesis Laboratory: A. K. IL'YASOVA, candidate of chemical sciences, and B. Sh. MUKHANBETKALIYEV, engineer (photos by E. Chikovani).

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## NEW PLANNING AND MANAGEMENT METHOD IN ESTONIA DESCRIBED

Tallinn KOMMUNIST ESTONII in Russian No 3, Mar 84 pp 39-43

[Article by I. Braun, laboratory chief at the Economics and Planning Scientific Research Institute under the EsSSR State Planning Committee, and candidate of technical sciences: "An Effective Planning and Management Method: Special Integrated Programs in the National Economy of the Estonian SSR"]

[Text] The 26th CPSU Congress stressed the need to make broader use of special integrated programs as integral parts of long-range state plans for economic and social development, to strengthen the foundations of these programs, and to increase their orientation toward final results and solving specific scientific, technical, economic, and social problems.

The goal of making broad use of the special program method in planning and management of the national economy was first outlined in the decree issued by the CPSU Central Committee and the USSR Council of Ministers in 1979 "On Improving Planning and Intensifying the Effect of the Economic Mechanism on Increasing Production Efficiency and the Quality of Work." The importance of coordinating integrated programs with the corresponding sections of the state plan, and with material and financial resources, was also stressed.

The December (1983) Plenum of the CPSU Central Committee set the goal of making further improvements in economic management and planning. The following statement was made at the Plenum: "Specific forms of management and planning must correspond to actual conditions at each stage of the country's social development. This is an objective, natural principle which clearly cannot be changed or revoked by anyone. Therefore, improving the system of management based on principles of democratic centralism is an integral part of the over-all process of improving our social system."

The dynamic development of our country's economy and the creation of its powerful production and scientific and technical potential are the result of the selfless labor of the Soviet people, guided by the CPSU. Over the past two decades the national income has more than doubled. The successes that have been achieved are convincing confirmation of the vitality of the system that has been created for planning and management of the national economy. But life keeps moving forward, demands increase, the scale of production grows, and economic ties become more complex. Scientific and technical progress is an important factor in the further development of the national economy. Therefore, certain planning and management methods which only recently proved

themselves fully, can turn out today to be rather ineffective. For example, they may not ensure a rapid rate for introducing scientific and technical achievements, intensification of production, and growth in economic effectiveness. Intersectorial and interdepartmental problems are difficult to resolve.

Just what are the shortcomings of traditional planning and management?

It is well known that in general terms, planning involves setting goals, developing measures to meet these goals, determining who is to carry out these measures, and the time limits within which the work is to be done. The state plans for economic and social development of the Estonian SSR set the republic's most important national economic goals for the coming planning period, as well as the basic measures that will ensure fulfillment of these goals. These plans are not detailed, since they are oriented toward sectors and subsectors of the economy, as well as territories; and the measures and goals outlined in the plans are aimed at the level of ministries, departments, or city (or rayon) soviet executive committees.

In turn, ministries, departments, and soviet executive committees work out their own, more detailed plans that set goals for each enterprise within their system or territory. The basis for these assignments are the goals set in the state plans for the republic's economic and social development, in addition to the demands for development in the sector that is subordinate to the planning agency. This planning system is influenced to a significant degree by departmental interests.

Therefore, traditional planning is carried out at various levels (the planning document drawn up by a specific collective of specialists is meant for just one level, so major problems may be given just superficial treatment in this type of plan).

This can give rise to possible errors in planning, such as inadequate coordination between plan goals and the demands and actual possibilities of the entire national economy, or the measures outlined may be ineffective or irrational. And any shortcomings in planning will have a negative effect on the final national economic results.

One of the directions for improving planning activities and bringing them up to date is broad application of special program planning. A special integrated program is a document which sets a precise goal; and stipulates means for achieving this goal, who will carry out various assignments, and a system for control and regulation.

Compared to the development of other planning and management documents, the preparation of special integrated programs is much more complex, since the same specialists must plan the activity at all levels of management and each specialist must set goals and determine measures that will ensure the most rational fulfillment of these goals. Setting up any program requires an integrated approach to the resolution of many management, scientific, technical, economic, legal, and social problems; this is within the power only of scientific research institutions, industrial design bureaus, and planning

organizations, and only when they work in cooperation with planning agencies, ministries, and departments. It is just as complicated to organize the implementation of special integrated programs, since each program includes several ministries and departments. A special management system (or agency) is, as a rule, created so that this work will go as smoothly as possible. Thus, the bulk of the work in special program planning falls on scientific institutions, and planning and design organizations. Planning agencies are responsible for methodological guidance and for coordinating the programs with state plans for economic and social development.

The use of special programs improves the quality of planning: problems are dealt with in more depth; the goals that are outlined and the means for achieving them have a more solid foundation; an integrated approach is taken to meeting the goals that are set; diverse measures are implemented, and so on. All this is aimed at increasing the effectiveness of the national economy.

Of course, the special program method is not a replacement for, but a supplement to the existing system of planning and plan implementation. If the field of vision in over-all national economic planning encompasses all problems in the republic's economic and social development, the new method represents a more individualized approach, with attention focused on just one issue. This is the source of the great effectiveness of the special integrated programs in resolving especially complicated and pressing problems. An attempt to resolve several problems at once within the framework of these programs automatically breaks up the focus of the work; problems arise in providing the necessary resources for all the planned measures and there is a drop in the efficiency of their use. In other words, special integrated programs are used only when this approach is especially expedient from economic and organizational standpoints, and when the regular system of planning and plan implementation will not provide the desired results.

The possibilities of special program planning are not limited to use only at the higher levels of national economic management. This method also has positive results in separate sectors or subsectors of the economy, and at the regional level, in associations, and enterprises. Therefore, the 18th CPEs [Communist Party of Estonia] Congress obliged the ESSR State Planning Committee, ministries, departments, and enterprises to implement measures of a special program nature that will provide an increase in the scientific and technical level of all production.

Here in the Estonian SSR during the 11th Five-Year Plan 12 economic, social, and territorial integrated programs are being worked out at the republic level of national economic management to resolve key issues in the republic's economic and social development. Another 10 republic-wide scientific and technical programs should be added to this list.

Furthermore, special integrated programs are being developed at other levels of national economic management. For example, several programs are being developed and implemented within the ERSPO [expansion unknown] system for accelerating scientific and technical progress in trade; and at the initiative of the Narva city party committee, special integrated programs for developing municipal services are being implemented between 1981 and 1985.

We will take a look at several of the republic's special integrated programs that are being worked out in accordance with the well-known decree issued by the ESSR Council of Ministers.

#### Increasing labor productivity in industry and construction.

According to forecasts, during the 11th Five-Year Plan the growth rate of manpower resources throughout the country will drop to one-fourth of the previous rate; in the republic, the growth rate will be one-third the former rate. Under these conditions, accelerating the rise in labor productivity is a goal of immense national economic importance. As noted at the 18th CPES Congress, a rise in labor productivity is a crucial factor both in the further development of industry and in fulfilling annual plans.

The current rate of growth in labor productivity does not meet the demands of the national economy; the use of special program planning would be an expedient measure for accelerating this rate of growth.

The ESSR State Planning Committee has set as the main goals of this program achieving the entire annual increase in industrial output and construction work through an increase in labor productivity; reducing the industrial and production personnel at existing industrial enterprises by an average of 1-2 percent per year; and meeting plan quotas for construction without increasing the number of workers. Here it is essential that the rate of growth in labor productivity exceed the rate of growth in production output.

The primary goals of the program are being achieved by working out and implementing the following measures:

- maximum utilization of reserves for increasing labor productivity;
- comprehensive mechanization and automation of production;
- introduction of labor-saving processes and effective forms of labor organization;
- reduction of manual labor, and so on.

The part of the program that has already been prepared outlines the goals for increasing labor productivity up to 1985, and it has been reviewed and approved by the ESSR Council of Ministers. This document represents a distinctive set of goals that set yearly manpower limits and quotas for increasing labor productivity for ministries, departments, and enterprises included in the agreement.

It should be pointed out, however, that in the preparation of the program, not all the requirements for this type of work are being observed yet. The program itself is not coordinated with material and technical resources and it does not include measures that are needed to meet the goals that have been set. Further development of the program has been organized so that every ministry, department, and enterprise included in the agreement will determine for itself the measures and means for meeting the goals.

In spite of the fact that the part of the program aimed at the period up to 1985 is already being implemented, it is still too early to say anything about the results. However, a definite stimulus has been given to increasing labor productivity in the republic's industry and construction.

**The Estonian SSR Food Program.** (The territorial section or sub-program of the corresponding unionwide program).

In our country and our republic, as in a number of other economically developed countries, the problem is not the total quantity of food products, but their consumption pattern. The party has described the goal of the USSR Food Program as follows: using the country's increased economic potential, to provide in the shortest amount of time possible a steady supply of all types of food to the population and to make significant improvements in the people's eating patterns by providing the most valuable products. The basic tasks of the Estonian SSR in carrying out the USSR Food Program up to the year 1990 are: using the dairy farming potential and the experience in raising pigs for bacon, to provide average annual meat production of 210,000-215,000 tons (slaughtered weight) during the 11th Five-Year Plan and 235,000-240,000 tons during the 12th Five-Year Plan; milk production of 1.2-1.3 million tons and 1.3-1.4 million tons, respectively; and grain production of 1.4-1.5 million tons and 1.5-1.6 million tons, respectively; to increase over the next 10 years the gross potato harvest by a factor of 1.2 and fodder production by a factor of 1.4; to drain 170,000 hectares of wetlands; and over the 10-year period to increase the output from raw materials of state meat resources by a factor of 1.3 and state cheese resources by a factor of 1.9.

The program has two special features: in the first place, it is of a predominantly directive nature (it was formulated not as a strict directive document, even though on the whole this is a requirement of special integrated programs); and in the second place, the basic emphasis of the program is on increasing the production of agricultural raw materials (in the future, apparently, the stress will be shifted to developing the food industry and the system for supplying the population with food).

The development of intersectorial plants for manufacturing products used in general machine building and metalworking. (This is also a territorial section or subprogram of the unionwide program.)

The main goal of the program is to manufacture products used in general machine building, the output of which fully meets the industry's demands, which falls under the jurisdiction of the ESSR Council of Ministers; in addition to expansion of long-term cooperative ties.

In subsequent five-year plans the basic indicators of the program will be included in plans for the economic and social development of the Estonian SSR. One of the most important final results of the program will be an increase in the republic's production of cast iron to 47,000 tons by 1995 (this represents a 15.1 percent increase over 1980). The growth in production will be achieved primarily through the construction of a cast iron machine shop at the ERSPO commercial equipment plant in the town of Rummu. There will also be an

increase in casting production at the "Vol'ta" and "Il'marine" plants. There will be a rise in the production of molding loam (sand) at the Piuza sandpit.

Rational utilization of timber and by-products from the woodworking industry.

The timber industry complex has been developing fairly well in recent years, but there is now a problem with a shortage of raw materials and manpower resources. In the formulation of a special integrated program, the main goal is rational utilization of timber and woodworking industry by-products, so that local timber resources can be used to meet as fully as possible the timber demands of the national economy and the population.

The development of transportation with the aim of meeting the demands of the republic's national economy and population.

The 18th CPEs Congress named transportation, especially railroad transportation, as a bottleneck in our economy. There was criticism of shortcomings such as long layover periods for transportation equipment that exceed plan norms, poor organization and mechanization of materials handling operations, irrational utilization of carrying capacities and space in motor vehicles, railcars, and ships. It was pointed out that the smooth-flowing operation of many enterprises is often disrupted by the railroad system. Several departments and enterprises are doing a poor job of developing and organizing the operation of transportation shops and services and warehousing services.

The special integrated program is aimed at eliminating shortcomings in transportation and improving the organization of shipments in the republic; it is a measure that was adopted as fulfillment of the directives of the CPEs Congress. Today a unionwide long-range special integrated program to develop the country's transportation system up to the year 2000 is also being worked out.

The development and optimization of distribution of warehousing services.

The Basic Directions for the Economic and Social Development of the USSR set the goal of strengthening and improving the statewide system of material and technical supply, and increasing its role and responsibility for rational utilization and conservation of material resources, and continuous supply of raw materials, production materials, equipment, and spare parts to the national economy. To meet this goal in our republic there must first be improvement in the warehousing services, which are a weak link in the system of the ESSR Ministry of Trade, the Ministry of Procurement, and the ESSR Agroindustrial Association. This particular program will also call for strengthening of this link.

Development of production of new efficient construction materials and components.

Many problems are involved in the accelerated development of the construction materials industry. Within the framework of this particular special integrated program, an effort will be made to resolve only a few of them. The main goal

of the program is to provide the republic's construction organizations with as many efficient new materials and components as possible, by developing local production and organizing deliveries from other union republics.

#### Mining and rational utilization of nonmetallic construction materials.

The program is essentially completed, but is in need of a bit more revision; it is also tied to the development of the construction materials industry in our republic. It is designed to promote more complete satisfaction of the demands for all types of nonmetallic construction materials, with the minimum expenditure of all types of resources on their extraction, transport, and consumption.

#### Development of the city of Tallinn and its surrounding areas.

With the rapid growth of the capital of the Estonian SSR, its nonproduction sphere has been lagging behind the production sphere in terms of its development. There are serious shortcomings in the city's nonproduction infrastructure. This special integrated program is aimed primarily at eliminating these shortcomings.

#### Optimal utilization and reproduction of natural resources, and protection of the environment in northeastern Estonia.

The goal of this program is to achieve optimal, comprehensive use of natural resources in the social and economic development of northeastern Estonia, while making a fundamental improvement in the reproduction of their potential and bringing the condition of the environment into line with accepted standards.

#### Utilization of local and secondary raw materials in the national economy and in the production of consumer goods.

A decision of the 18th CPEs Congress points out the need for over-all development and implementation of specific measures to eliminate losses and reduce the waste of raw materials and other production materials, and to provide more active inclusion of secondary material, fuel, and power resources, as well as by-products and local raw materials in the economic cycle. It also stresses that party, soviet, and economic organs, ministries, departments, enterprises, and associations should show greater concern for fully meeting the population's demands for consumer goods by persistently seeking out reserves for future increases in their production.

All these goals will be met in the course of implementing this particular program.

#### Conservation of fuel and power resources.

The work that is being done in our republic to make more rational use of fuel and power resources still does not meet the requirements set by the party. Many enterprises, organizations, and farms are doing a poor job of utilizing their potential for economizing, and the losses of fuel and power are high. Secondary fuel and power resources are being brought into use slowly; the

process of centralizing the heat supply for cities and other localities in the republic is slow; and the liquidation of small-capacity and uneconomical boiler plants is also proceeding at a slow pace. The norms and accounting methods for fuel and power consumption are inadequate.

The CPEs Central Committee and the ESSR Council of Ministers assign immense importance to strengthening the policy of economy for fuel and power resources and to reducing the wasteful losses of these resources in the republic's national economy, so they have set the goal of developing an appropriate special integrated program to resolve the problems described above.

In addition to the programs named here, republic scientific and technical programs are being developed or have already been developed on the following topics:

- forecasting and planning the economic and social development of the ESSR
- comprehensive utilization of natural resources and environmental protection;
- comprehensive utilization of oil shale;
- rational utilization of phosphorite deposits in the ESSR;
- fine organic synthesis;
- physico-chemical biology and biotechnology;
- compound biochemistry;
- scientific instrument building;
- microprocessor systems for automation and computer technology;
- semiconductor heteroconversions.

Some of the special integrated programs named in this article have been reviewed and approved by the CPEs Central Committee and the republic's government and are already being implemented; and some are still in the development stage. Most of them are meant to cover the periods up to 1990, 1995, and 2000.

A considerable amount of work has already been done on special program planning in the Estonian SSR during the 11th Five-Year Plan; this, of course, has a positive effect on the development of the republic's national economy. The results of the new method could be greater, however. Special program planning in the republic is still not being carried out at the proper level, and a number of programs do not meet the requirements set by the USSR State Planning Committee. The direction of the programs often remains poorly defined; the goal may not be clearly outlined; the key problem to be resolved within the framework of the program is not formulated; and it is not indicated what changes should take place as a result of realizing the program's main goal. Adequate material and financial resources are not always provided for implementation of the programs.

These shortcomings are primarily the result of lack of experience. After all, the extensive development and implementation of special integrated programs is something new both in the republic and in the country. This is essentially an experiment in resolving the most important problems in national economic development. But we learn from our mistakes, and experience will come with time. In the republic it is necessary, first and foremost, to develop the foundations of a system for managing special program planning. Until we have

mastered all the fine points in the methodology of setting up and implementing special integrated programs, we cannot organize unified methodological control over their development; and there is still a great deal of room for improvement in the organization of this work.

The most important task now is to draw manpower and means from the republic's scientific institutions and VUZes into the development of special integrated programs.

Programs will continue to be developed in the next five-year plan. The ESSR State Planning Committee is preparing a draft of a list of these programs for the 12th Five-Year Plan. In order to avoid previous mistakes, methodological and organizational innovations are planned, and measures are being taken to improve the quality of all this work. A goal has been set to make maximum utilization of the advantages of special program planning as a rational means of resolving key issues in economic and social development. Skillful application of this method will make it possible to manage the economy more effectively, to intensify production, and to make better use of scientific and technical achievements, which are demands set down in the decisions of the 26th CPSU Congress and the December (1983) Plenum of the CPSU Central Committee.

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## KAZAKH SCIENTIFIC ACHIEVEMENTS DEMONSTRATED AT EXHIBITIONS

Alma-Ata NARODNOYE KHOZYAYSTVO KAZAKHSTANA in Russian No 1, Jan 84 pp 55-56

/Article by K. Oruntayeva and Ye. Yemel'yanova, candidates of biological sciences: "Scientists' Research at Exposition"

/Text Exhibitions are effective means of information and popularization of scientific and technical achievements. They graphically point to the high level of development of science and technology, contribute to the introduction of its discoveries into the national economy and promote the strengthening of friendship and cooperation among states.

The scientific institutions of the Kazakh SSR Academy of Sciences perform significant work in this direction. Participation in thematic, intersectorial specialized and permanent exhibitions at the Exhibition of USSR National Economic Achievements and at the Exhibition of Kazakh National Economic Achievements, as well as in international opening days of exhibitions and fairs, has become an integral part of their activity.

Scientific councils for exhibitions of the USSR and Union republic academies of sciences organized about 100 exhibitions and expositions in 1982. More than 10,000 instruments, units, models, samples and other exhibits were demonstrated. A total of 110 popular science films were shown and more than 1 million copies of stand literature were disseminated. Almost 25 million people visited the exhibitions.

The Kazakh SSR Academy of Sciences also made an appreciable contribution to the organization of opening days of exhibitions. The results of research by the republic's scientists in various fields of natural and technical sciences were presented in the Physics, Space, Biology and Machine Building pavilions at the Exhibition of USSR National Economic Achievements. In accordance with the decision of the Main Committee for Exhibition of Achievements of the National Economy eight diplomas, five gold medals, nine silver medals and 36 bronze medals were awarded to Kazakh creators of the best projects.

The following projects were awarded gold medals: "A Vacuum Apparatus for Tin Refining" and "A Method of Extracting Gallium From Alkaline Gallium-Containing Solutions" of the Institute of Metallurgy and Concentration, "Production of Ultra-Pure Metals" of the Institute of Organic Catalysis and Electrochemistry, "A New System of Ignition of Internal Combustion Engines With a Surface Current Discharge" of the Institute of Mining and so forth.

The projects "A Supersensitive Measurer of Low Currents for Investigation of Electric Conductivity of Liquid Dielectrics" of the Institute of Chemistry of Petroleum and Natural Salts, "Protective Aluminum-Based Alloy" and "Mixed Palladium Catalysts" of the Institute of Organic Catalysis and Electrochemistry, "Technology of Ascending Layer Extraction With Filling of the Worked Out Space and Use of Self-Propelled Equipment" of the Institute of Mining, "A Method of Treating Fur Skins" of the Institute of Microbiology and Virology and others were awarded silver medals.

Many developments give a big economic effect and have been introduced into the national economy. They were demonstrated at the expositions "Achievements of Kazakh SSR Inventors and Innovators" and "In a United Family."

The creative work of the Society of Kazakh Inventors and Innovators is extensively represented at the former. In the all-Union socialist competition of oblasts, krays and republics for the second year in succession they have won the Challenge Red Banner of the USSR State Committee for Inventions and of the Central Council of the All-Union Society of Inventors and Innovators.

The Kazakh SSR Academy of Sciences was awarded the first-class diploma for the display of highly efficient inventions developed at its scientific institutions.

The exposition "In a United Family" was devoted to the 60th anniversary of the day of formation of the USSR and showed the basic achievements of fraternal Union republics. The Kazakh SSR Academy of Sciences demonstrated the projects "A Climatic, Thermoregulating Box-Type Chamber" and "A Device for Isofocusing" of the Institute of Botany, "An Electromagnetic Drilling Machine" of the Institute of Mining and "A High-Precision Small-Size Quick Operating Thermostat" of the Institute of Chemistry of Petroleum and Natural Salts.

The expositions of the Kazakh SSR Academy of Sciences were also demonstrated at the all-Union exhibition "Scientific and Technical Creative Work of Youth" (NTTM-82).

The project of the Institute of Mining "A Method of Eliminating Ore Hanging in Open Pits and Bunkers," which was demonstrated at the thematic exhibition of NTTM-82, received the diploma of the Central Committee of the Komsomol, of the USSR State Committee for Science and Technology, of the Central Council of the All-Union Society of Inventors and Innovators and of the All-Union Council of Scientific and Technical Societies and the title of prize winner.

The research results of the Kazakh SSR Academy of Sciences were presented at international exhibitions abroad. For example, the work of the institutes of chemical sciences, organic catalysis and electrochemistry, microbiology and virology was shown at the Fifth Specialized Chemistry-82 Exhibition.

The exhibits "The ES-15TA Ore Trolley-Accumulator Dumper" and "A Device for Clearing the Exhaust of Pneumatic Drilling Machines of Oil Aerosols" of the Institute of Mining, "Protective Alluminum-Based Alloy" and "A Continuous Method of Fat Hydrogenation on a Stationary Catalyst" of the Institute of Organic Catalysis and Electrochemistry and "A Protein-Fat Concentrate" of the Institute of Chemical Sciences were demonstrated at an exhibition in the city of Plovdiv (Bulgaria), which coincided with a technical fair.

More than 10 developments were exhibited at the exposition "Science, Technology, Economics and Culture of the Kazakh SSR" in the city of Sarajevo (Socialist Federal Republic of Yugoslavia). The work "Dry Bacterial Ferments" of the Institute of Microbiology and Virology evoked special interest.

The inclusion of new topical scientific developments used in practice in exhibitions makes it possible to acquaint the foreign public with the works of Soviet scientific schools and with the great contribution of the USSR to the development of world science and technology. The presence of competent representatives of science and highly skilled specialists, who can give consultation and answer questions, also contributes to success.

The Kazakh SSR Academy of Sciences constantly expands the framework of participation in both Soviet and foreign exhibitions. In 1981 its institutions participated in 15 exhibitions, in 1982, in 18 exhibitions and during 6 months of 1983, in 10 exhibitions. Their subject-matters expand constantly as a result of new developments of urgent scientific problems.

The Commission for Exhibitions under the Presidium of the Kazakh SSR Academy of Sciences pays special attention to the organization of thematic exhibitions with a demonstration of completed scientific investigations of applied importance and with conferences, seminars and schools held at their base.

Thematic exhibitions with seminars on exchange of experience on the subjects "Transport and the Environment" and "Scientific Principles of Planting Trees and Gardens in Kazakhstan's Industrial Centers," an inspection of flowers "Spring Melodies" and so forth were held at the Exhibition of Kazakh SSR National Economic Achievements during the first half of 1983.

The object of the opening days of exhibitions is not only to tell about what has been achieved.

An exposition should be directed toward the future. It is a propagandist and conductor of everything that is new and advanced. Its layout, beginning with the construction of stands and ending with the appearance of dummies and models, should correspond to the profound content of achievements in a specific national economic sector.

The requirements of technical esthetics placed on existing dummies and natural models increase constantly. However, in the institutes of the Kazakh SSR Academy of Sciences exhibits are made by the personnel of laboratories not having special training. Therefore, the quality of the exhibits made leaves much to be desired.

These difficulties can be eliminated through the centralized planned production of natural models at the base of experimental shops of one of the institutes or special design bureaus of the republic's Academy of Sciences.

Nor is the situation with the publication of stand information literature on projects accepted for exhibition satisfactory. There is a shortage of colorfully designed prospectuses.

In our opinion, it is necessary to annually include a list of advertisement-information literature with an obligatory execution of orders for the opening of exhibitions.

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## SYSTEM FOR INCORPORATING SCIENTIFIC DEVELOPMENTS DESCRIBED

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 3 Apr 84 p 2

[Article by Yu. Svintitskiy and G. Namtalashvili, SOTSIALISTICHESKAYA INDUSTRIYA correspondents: "Science Uses the Contract System"]

[Text] Karl Semenovitch Chelidze, GSSR deputy minister of higher and secondary specialized education, said, "Quite a few of the developments coming out of VUZes require considerable capital outlays. But they can also provide a substantial effect. And a rapid effect. In spite of this, as the saying goes, they have been gathering dust on a shelf. The aim of work now being done in the republic is to open up a path for bringing these developments to life."

Specialists at the ministry told us of quite a few research topics which are being pursued with the express goal of incorporating developments into practice. Among these are the development of waste-free manufacturing processes, specifically for the meat and dairy industry; a mechanized method for welding assemblies for cement furnaces; creating a fundamentally new machine tool with numerical programmed control; and many others. There are also projects that are truly surprising. We became familiar with one such project on a visit to Tbilisi State University.

Nodar Sardinovich Amaglobeli, pro-rector of the university and corresponding member of the GSSR Academy of Sciences, told us, "Have a look," as he moved a little pot closer.

These pots could be used to grow flowers, or greenhouse seedlings. There was nothing in those pots that had anything to do with the heights of scientific thought, which we expected to discuss. Our faces probably reflected our doubts: a black plastic pot--what is so unusual about it?

The scientist explained, "It is unusual because waste products from livestock breeding were used to make it. Incidentally, these wastes are a big problem for farms."

Later in an official reference book we read that this same method helped solve the problem of waste-free utilization; it has made possible the complete elimination of sawdust, a product which is expensive and in short supply, from the well-known composition board products; it has made it possible to protect the environment from pollution and to provide agricultural production with

plastic materials. This development has already been put into practice: a shop has been set up for the production of composition board and articles made of plastic. The economic effect will be in the millions of rubles.

The incorporation of new technology is one of the results of the work being done by the republic coordinating council for science and scientific and technical progress that was formed under the CPGe Central Committee. It is striving to direct the efforts of party organizations, and all the planning, economic, financial, and scientific units in the republic toward accelerating the incorporation of scientific and technical achievements, eliminating obstacles from their path, and developing and implementing an incentive system. The search is on for new forms of integrating science and production. One such form has already appeared and is growing stronger: in the republic it is called the principle of partnership.

This is what happened in Makharadzevskiy rayon, for example. A local agricultural production association and a tea industry scientific production association, the Anaseul Scientific Research Institute, entered into a cooperative arrangement. The goal was to make maximum use of low grade tea leaves and waste products from tea production. After the research was done and detailed calculations made, the partners combined forces and created a plant for producing a natural tea concentrate and a tonic beverage. The agricultural association allocated the means, and the scientific production association drafted the plans. Construction took only 3.5 months. The outlays totalled 660,000 rubles, and the profit for just one year was 1.3 million rubles.

What are the results of partnerships? What are the benefits? The agricultural organizations supplying the tea leaves and the tea factories received benefits. The institute also gained from the partnership: for its economic incentive fund it received 20 percent of the profits from the new plant.

One must agree that this experiment was unusual, if only because it depended on nontraditional forms of cooperation and incentive practices. But the republic's party organization has moved boldly to support it, clearly identifying the most important advantages of partnership. The major advantages are: the principle of partnership can overcome departmental barriers. The participants in joint work do not enter into an official association; they are tied only on a temporary basis for the time it takes to meet the scientific and technical goal and to obtain an economic effect. The existing structure of scientific institutions need not be disturbed. And the scientists' developments are provided with a rapid road to incorporation. Finally, there is a greater economic incentive for scientific organizations and the scientists themselves, who are participating directly in the developments and their incorporation. In addition, this form of economic incentive is aimed at shorter deadlines for incorporation and a high level of development--the rewards are made after the innovation has undergone practical testing and they depend on the actual economic effect that is obtained. The sooner you incorporate the development, the sooner you receive a reward.

K. Chelidze said, "This situation has drawn many scientists into working on practical problems. They saw real prospects, and recognized their opportunities. How does it sound, science working on a contract system? A

little unusual, perhaps? But you should see what the essence of our undertaking is.

Three of the republic's leading higher education institutions are the pioneers--the State University, the Georgian Polytechnical Institute, and Kutaisi Polytechnical Institute. They have identified a number of topics for which the principles of partnership would be both expedient and possible. Organizational changes are now being made. A new provision on the wage system and economic incentives has been developed and is now in being put into force.

One of the pivotal points of this system is that over the course of three years after a development is incorporated into production, the enterprise transfers to the VUZ up to 30 percent of the additional profit it actually obtained from the development. How are these funds allocated? Eighty percent is distributed equally among funds for the development of the VUZ's scientific research base, for social and cultural measures and housing construction, for economic incentives for VUZ employees and those representatives of production who participated actively in the incorporation the development. Twenty percent is transferred to the republic's Ministry of Higher and Secondary Specialized Education for use in its centralized funds.

On the basis of this provision, what are in essence creative brigades are formed, which operate under a distinctive kind of contract. They can invite an outside specialist and pay for his services. The earnings are distributed to the members according to the contribution they made.

I. Zhordaniya, deputy chairman of the GSSR State Planning Committee, said, "Of course, the problem of incorporation has many aspects, and scientists alone cannot resolve it. We believe that a very important link is the formation of experimental production bases for VUZes, where models of new mechanisms can be produced, and the technology can be worked out. It is just as important to have special reserves of funds and materials at enterprises so that they can incorporate innovations without disrupting plan discipline. The republic's State Planning Committee is now taking measures so that the incorporation mechanism will operate smoothly, and so that efforts will be coordinated. It is necessary to take special care to select the scientists' proposals that promise to provide the greatest effect, and to do a skillful job of preparing the technical and economic foundations for incorporation..."

It must be noted that one can see many aspects of the reorganization that has begun in the republic, and that serious preparations are being made to eliminate obstacles and to open up bottlenecks. Of course, no claims are being made that the system can solve all the problems of accelerating scientific and technical progress. It is aimed primarily at providing a rapid effect. This means that one must also think about how not to lose one's perspective, and how to improve work being done under long-range programs.

One must also recognize the danger of distortions in the economic incentives for scientists and those participating in incorporation. In this connection, the role of control is increasing, as is the degree of influence of social organizations. And the principle of partnership increases the role of the scientist-leader. He must be an authority, both as a specialist and as a

citizen. The efforts of the republic's party organizations today are aimed at developing in the scientist this kind of understanding of his role and his duty.

The experiment being conducted in the republic is of special interest. Practice will tell us what corrections and adjustments need to be made. But the foundation has been laid and the first steps have been taken.

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## LENIN PRIZES IN SCIENCE AND TECHNOLOGY AWARDED

Moscow PRAVDA in Russian 25 Apr 84 p 2

[Article by A. Aleksandrov, chairman of the USSR Committee for Lenin Prizes and State Prizes in Science and Technology under the USSR Council of Ministers: "Steps Into the Future"]

[Text] The publication of the seven Lenin Prizes awarded for outstanding achievements in science and technology was timed to coincide with the 114th anniversary of the birth of the great Lenin.

Consideration of the work submitted in the competition for the Lenin Prize is always an important review of our scientific and technical achievements.

What is the significance of the projects that were awarded the Lenin Prizes in 1984?

We are all familiar now with the word "laser" and we know of the widespread use of lasers in the most diverse areas. The laser beam is used in surgery, in the treatment of eye diseases and a number of other illnesses, for welding and cutting metals, for fine technological operations and microelectronics, and many other purposes. The idea of the laser was born in the USSR. The substances that comprise the laser's optical system absorb energy that is fed into it and then emit part of this energy in the form of a narrowly directed cohesive beam. The laser "pump" can be produced by feeding in different types of energy (light, for example) and using different methods. The authors, G. K. Vasil'yev, Y. P. Markin, A. N. Orayevskiy, and V. L. Tal'roze, proposed lasers that operate on chemical chain reactions, specifically branched reactions, in the substance of the laser itself, initiated by introducing a chemolaser mixture of free radicals.

The energy for the pump comes from the reserve of reacting substances, for example, deuterium and fluorine, and not some complex system. The laser itself is very efficient at transforming chemical energy into cohesive light. These lasers can operate with both an impulse pattern and a continuous pattern. The achievements of these authors, who proposed and studied the most complex processes occurring in chemical lasers, have been recognized by the world scientific community, and Soviet science is the leader in this field.

Another study that was awarded the Lenin Prize, "The Theory of Thermonuclear Toroidal Plasma," forms the fundamental basis for resolving the most complex problem in contemporary physics--the problem of peaceful uses of energy from controlled thermonuclear synthesis. Two possibilities have now been discovered for utilizing the immense energy that is given off from several transformations of atomic nuclei: utilization of the chain reaction from the fission of heavy nuclei (of uranium or plutonium, for example), and utilization of the energy from the synthesis of light nuclei, of deuterium and tritium, for example. Utilization of these two pathways would make it possible to provide all mankind with unlimited sources of energy. Keeping in mind the finite reserves of oil, gas, and coal, it is difficult to name a problem that is more important for all of humanity.

The fission of heavy nuclei is being utilized effectively in atomic power engineering in the world today. The problem with this method, however, is the large quantity of radioactive waste that must be stored safely for thousands of years until it decays. Power engineering based on the synthesis of light nuclei not only produces substantially less radioactive waste, it can also be used to destroy radioactive waste resulting from "ordinary" atomic energy production.

The combination of these two types of atomic energy production will also help solve problems of obtaining materials from depleted ores; in other words, it will help create the material foundations for mankind's future existence. Controlled thermonuclear synthesis can be carried out in deuterium plasma or in the plasma of deuterium combined with tritium, with a temperature of hundreds of millions of degrees and which lasts long enough at these temperatures. The plasma can be heated initially by running a current through it, and continued heating can be done by introducing laser radiation, superhigh frequency radiation, compression, and so on.

The world leader in this field was created in the Soviet Union; it is the "Tokomak"--large toroidal vacuum chambers in which a plasma ring is formed. The stability of this ring, the thermal processes in it, isolation of the plasma toroid from the walls of the vacuum chamber by restraining it with a magnetic field, all sorts of plasma instability, the appearance of nonlinear processes in the plasma, and the behavior of admixed particles all are some of the most complex physical problems that must be solved for the practical implementation of the process of thermonuclear synthesis.

Many years of joint work by theoretical and experimental physicists led to the creation, with other scientists in foreign countries, of a new branch of contemporary physics--high temperature plasma physics. The work done by A. A. Galeev, B. B. Kadomtsev, L. M. Kovrizhnyye, O. P. Pogutse, R. Z. Sagdeyev, and V. D. Shafranov has received worldwide recognition. Their work forms the basis for experimental equipment that has been and is being created and it has made it possible to move to the most recent experimental stage--the creation of a prototype of an experimental industrial thermonuclear reactor. It must be pointed out that the work in plasma physics has given rise to numerous practical applications for "low-temperature" plasma, and especially in the area of chemical reactions, to "plasma chemistry."

Next we have the work done in chemistry by B. A. Dolgoplosk and Y. I. Tinyakova. For over 20 years the authors studied the catalytic action of metalorganic compounds during polymerization. The structure of the elementary units that determined the "architecture" of the entire polymer chain is of key importance for the polymers' properties. The authors were the first to study the possibility of utilizing individual metalorganic compounds of transition metals as stereospecific (i.e., determining the spatial structure of the polymer) catalysts of the polymerization process.

The authors explained the nature of the active centers of various stereospecificity and the mechanism of stereoregulation. They studied the characteristics of copolymerization processes and the nature of secondary reactions that occur in the polymer chain under the influence of the catalytic systems, as well as transport processes of double bonds in polymer systems. It was determined that the final link in a growing polymer chain is responsible for the chain's structure. This research opened up the possibility of controlling the properties of polymers and copolymers. The authors introduced many means and substances for controlling the properties of polymer production, such as its resistance to cold and heat, mechanical properties, and so on, into the chemical industry, especially the synthetic rubber industry. This is especially important in light of the fact that significant expansion of the application of polymers is an pressing goal.

Also related to the field of chemistry is the work done by O. A. Reutov and submitted by Moscow State University. Although the author was primarily interested in the mechanisms of reactions in the field of metalorganic chemistry of nontransition metals, the course of research naturally led to the discovery of new methods for the synthesis and creation of numerous compounds.

For example, methods were developed for the synthesis of a number of platinum- and palladium-organic compounds, as well as chelate metal rings. These reactions have made it possible to obtain many metalorganic compounds, the molecules of which contain bimetallic and oligometallic chains. These and many other reactions represent an important contribution to the organic chemistry of nontransition metals.

The research done by N. F. Kazakov, N. S. Artemov, N. A. Lakin, Ye. A. Kotyurgin, Yu. B. Malevskiy, and G. K. Kharchenko on developing a method for diffusion compounds of metallic and nonmetallic materials is of great practical importance. Under the influence of temperature and pressure, through the diffusion of particles of one material into another, a stable compound (weld) is formed of heterogeneous materials, for example, ceramic and metal. The absence in this case of a thermal effect zone, which is formed in traditional welding methods (for example, in electric arc welding), prevents the formation of welding cracks. Widespread use of this new welding method depends to a considerable extent on strict reproducibility of its results. In many cases diffusion welding is being used successfully on combined pairs of materials, such as quartz and metal, which cannot be combined by ordinary welding methods.

The work done by I. A. Rapoport on chemical mutagenesis and submitted by the Chemical Physics Institute of the USSR Academy of Sciences is of great importance for the Food Program.

It is well known that certain substances cause intermittent changes in the hereditary properties of plants, animals, and microorganisms, which are called mutations. Chemical mutagenesis can be extremely dangerous. For example, certain medicinal substances produced by a Western firm were not adequately studied and led to birth defects in children. I. A. Rapoport studied a large number of chemical compounds with mutagenic properties and he studied in detail the types of mutations they caused. He utilized them, in cooperation with agricultural organizations, to develop new varieties of plants based on mutant forms that are superior to other plants in terms of their various properties.

For example, varieties were developed with higher yields; oil-producing plants were developed to yield an oil similar to olive oil; wheat with improved baking properties was developed, in addition to alfalfa with high feed qualities, and many other varieties of plants. A significant number of the new varieties are designated for cultivation in certain areas and they have been used extensively. Important results were also obtained in the study of mutagenesis of industrial microorganisms, which have made it possible to develop strains with a much higher productivity. The most important aspect of this work, however, has been the detailed study of controlling the process of mutagenesis.

Among the representatives of social sciences, the Lenin Prize was awarded for the series of studies done by V. L. Yanin and B. A. Kolchin, "A Historical and Archaeological Study of Novgorod." The research was carried out for over 50 years by means of archaeological expeditions which employed carefully developed methods, such as dendrochronology, metallography, spectrography, paleobotany, and others; this research revealed the extraordinary wealth of Novgorod's cultural past. The discovery of many birch bark documents made it possible to reproduce in great detail the political, social, and everyday characteristics of the boyar republic of Novgorod between the 12th and 15th centuries. Thanks to this research, our understanding of Novgorod's history has changed substantially. A whole world of artistic objects was discovered; the system used to decorate objects and buildings is now understood; the techniques used by ancient craftsmen has been determined, as has the character of the economy and foreign ties.

All the work described here has made a major contribution not only to our own science and technology, it has also enriched the world's scientific treasury.

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## SIGNIFICANCE OF RECENT SCIENTIFIC DISCOVERIES DISCUSSED

Moscow PRAVDA in Russian 15 Apr 84 p 3

[Article by S. Os'minina: "Discovered in the USSR"]

[Text] The discovery... A flight of inspiration which crowns difficult labor. A peak conquered. A stage in someone's career. And a rather commonplace event for the Discoveries Department of the USSR Goskomizobreteniy [State Committee for Inventions and Discoveries], occurring 15-17 times a year. On 15 April of last year the latest discovery was given No 271, while the most recent one was registered under No 288.

Just what has changed in our ideas about man and the world over the last year? Of course one can only judge this conditionally based on the registered discoveries, but still let's accept this conditionality and then it will turn out that...

The world around us changed noticeably during this year. Sun, earth, water, the earth's interior--we already picture them to ourselves differently in some ways. For example it has been determined that our sun contracts and expands 10 km every 160 minutes, its brightness also fluctuates in that same rhythm (this was discovered by scientists B. Kotov and T. Tsapu from the USSR AN [Academy of Sciences] Crimean Astrophysical Observatory under the direction of Academician A. Severnyy), that water on earth also pulsates, but that this previously unknown fast-moving pulsation is caused by stresses in the solid part of the earth's core. That water is a sensitive exhibitor of what is occurring within the planet was proven by doctors of geological-mineralogical sciences G. Vartanyan and G. Kulikov. And the globe is not at all as stable as it appeared. It was learned that it is an active medium. Major sections of the upper part of the earth's core shift, the temperature changes at their boundaries and energy-saturated areas appear. Hence the mysterious noises which usually arise during seismic measurements, to the annoyance of researchers. They thought it was interference, but it turns out this is our planet's voice, which now has been heard. For this the authors of the discovery, geophysicists L. Rykunov, O. Khavroshkin and V. Tsyplakov had to develop

instruments capable of registering movement of the ground by an amount less than the size of an atom. And now when the earth speaks to us in the language of noises the specialists are beginning to understand her speech.

Discoveries are like observation platforms on the endless ladder of man's ascent to knowledge. The aforementioned discoveries marked the beginning of new divisions of sciences: helioseismology and seismic surveying of active media appeared, and new concepts appeared such as the earth's hydrogeodeformation field. As a natural application of theoretical knowledge, new methods appeared for exploring and surveying useful minerals.

Many achievements in studying the microcosm have been recognized as discoveries. A joint group of Soviet and foreign scientists at the Serpukhov accelerator under the direction of USSR AN Corresponding Member Yu. Prokoshkin discovered an elementary particle named the "H meson." Ukrainian physiologists Academician P. Kostyuk, O. Kryshchal' and V. Podoplichko discovered the phenomenon of calcium permeability in the nerve cell: a system of ducts regulates the passage of calcium ions through the cell membrane, on which the movement of an impulse along a nerve fiber depends.

And so the cell, the very smallest unit of living matter, has revealed some of its secrets. It was learned that damages to cell membranes and the disturbance in the calcium balance in blood cells caused by such damages play a deciding part in the appearance of hypertonic illness. They are what "activate" the illness. Studies by Soviet scientists Yu. Postnov, S. Orlov and others from the USSR Ministry of Health Central Scientific Research Laboratory were repeated and confirmed in a number of laboratories in France, the United States and Japan. A diagnostic test was developed on the basis of the discovery of membrane disturbances in blood cells during hypertonia which permits distinguishing hypertonic illness from the symptoms of other ailments. Possibilities are opening up for seeking new medicinals and methods of treating the illness.

The incredible vitality of a living cell also has become apparent: it restores itself even after radioactive exposure seemingly lethal to it. This was discovered by Doctor of Biological Sciences N. Luchnik from the USSR AMN [Academy of Medical Sciences] Medical Radiology Institute. That means prospects are opening up for learning to control the radiosensitive genetic apparatus and actively intervening in the course of intracellular processes; for example, with tumor ailments, to control processes occurring in diseased and healthy tissues during radiation therapy by suppressing "attempts" to restore tumor cells and to support the healthy ones in every way.

A discovery always is a new aspect from which to view something, and this is productive. USSR AMN Corresponding Member A. Nesterov, an ophthalmologist, decided to examine the human eye from the position of hydrodynamics. As a result he succeeded in uncovering the mechanism by which one of the most widespread eye diseases arises--glaucoma or, more correctly, so-called primary glaucoma, which accounts for some 70 percent of the cases of this ailment. It turned out that the pressure of the optic fluid is regulated with the help

of a kind of drainage system: excess fluid goes through a reticular diaphragm into a canal located in the outer envelope of the eye. When disturbances begin in the work of this drainage system the outflow of fluid is disrupted and disease arises.

Diagnostic methods developed on the basis of the discovery provide a full picture of changes which have occurred in the drainage system. Most often it is necessary to "repair" the canal or make new paths for the outflow with a surgical operation or, which is enormously simpler, with a laser. There are laser centers operating in Moscow, Leningrad, Odessa, Krasnoyarsk and certain other cities.

Since the registration of discoveries began, which was in 1957, many projects advanced by scientific research organizations and individuals have been vying for the honor to be included in the State Register. Before arriving at the home stretch, which is examination at a session of the Goskomizobreteniy board, the applications undergo a lengthy check of many stages: many commissions of experts, the collection of comments, and discussion at a session of a council of experts. And even the board's decision for entry into the State Register is not the end of the path. There is a publication, after which another year goes by and if no protests of the discovery have been received during this time the authors are issued a diploma and a reward.

And so we have arrived at probably the most important element: In just what way are the discoveries so valuable that such a complicated procedure has been developed for filtering everything new in search of these truly golden grains? Each breakthrough into the unknown and mastery of previously unknown principles of nature is the basis for the development of new technologies.

Chemists (USSR AN Corresponding Member A. Shilov, A. Shteynman and N. Gol'dshleger) discovered a previously unknown property of saturated hydrocarbons which are a part of petroleum, natural gas and coal, learned how to make them chemically active, and real prospects appeared not only for developing inexpensive wastefree technologies for processing raw fuel, but also obtaining substances with specific, preset properties needed by industry. It is not difficult to perceive highly efficient chemical productions of the future behind the recently discovered principle of the synthesis of polymers from solid substances (authors of the discovery are Academician N. Yenikolopov, A. Zharov and V. Kapustyan). The conversions occur tens and hundreds of times faster in them than in ordinary cases with the very same substances in a liquid condition.

New industrial processes already have appeared on the basis of the discovery by a group of authors directed by Academician A. Belov and USSR AN Corresponding Member V. Dobatkin which allows obtaining high-grade metals and alloys with the so-called nondendritic structure.

It would seem that everything is known about combustion, or almost everything--man has been using this process for so long and so actively. But a recent discovery by USSR AN Chemical Physics Institute scientists

A. Merzhanov, I. Borovinskaya and V. Shkiro altered existing impressions of the mechanism of chemical interaction of substances during the combustion of solid mixtures. A study of the processes discovered by the authors led to creation of a new division of combustion science--the theory of gasless combustion.

For practical purposes this means that high-temperature ovens with all their complicated equipment no longer are necessary for obtaining powders of refractory compounds being widely used in many sectors of industry as abrasives, electrodes and solid lubricants. The production cycle will be cut in half while the useful life of abrasives freed of admixtures will double. The new industrial method for obtaining metal-ceramic materials is called "self-propagating high-temperature synthesis" (SVS). It is protected by more than 20 author's certificates, some of which are being patented abroad. This method already has been used to synthesize some 300 materials being used in machinebuilding, electrical engineering and radio engineering.

"A discovery often becomes 'overgrown' with tens or even hundreds of inventions," remarks I. Nayashkov, chairman of the USSR State Committee for Inventions and Discoveries, "and they determine the advance of scientific-technical progress. It is possible to move forward with the small paces of an improvement of something old or it is possible to make a leap, far outstripping everyone at once. A discovery is the possibility of a leap and therefore it is so important for the fruits of a breakthrough into the unknown to be used without delay in technology. A discovery which does not work for the people's welfare is the very same as millions gathering dust in a trunk."

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## AUTOMATION EXPERT URGES GREATER USE OF COMPUTER TECHNOLOGY IN INDUSTRY

Minsk SOVETSKAYA BELORUSSIA in Russian 15 Apr 84 p 2

[Interview with O.I. Semyenko, candidate of technical sciences, director, Technical Cybernetics Institute, Belorussian SSR Academy of Sciences, by S. Ivanova, special correspondent; date and place not specified; entitled: "Strive to Achieve More"]

[Text] For achieving high results in All-Union Socialist Competition, and for successful fulfillment of the USSR State Plan for Economic and Social Development, the Technical Cybernetics Institute of the Belorussian SSR Academy of Sciences was awarded the 1983 Challenge Red Banner of the CPSU Central Committee, USSR Council of Ministers, AUCCTU and Komsomol Central Committee.

[Question] Unquestionably the high marks for the work of the collective are recognition of the achievements of the scientists at the institute both in the development of scientific trends and in implementing their ideas in the national economy. Which results could you, Oleg Ignat'yevich, single out as the most significant, which assured your success in the competition?

[Answer] They are associated with such research projects as working out the theory for, creation of, and ways to use microprocessor technology; automation of planning, management and manufacturing of products; and certain questions of the theory of gathering, assembling and transmitting information; and a number of others.

Creation of microprocessor equipment has become a principally new direction in science and technology. But its introduction to the national economy has been delayed by a number of unresolved problems. A group of scientists from the institute, under the leadership of A.D. Akrevskiy, corresponding member of the Belorussian SSR Academy of Sciences, has worked out a theory and principles for logical synthesis on the basis of microprocessors; and scientists at the special computer equipment laboratory, together with designers from the SKTB [Special Design and Technological Office] and OP [Experimental Production] have created an original automated system for programming and adjusting microprocessors--a system called "METAMIKRO," which permitted a three-to-fivefold increase in the labor productivity of the programmers. The system is universal and simple, and is suitable for various types of devices. It was awarded a certificate at the "Nauka-83" [Science-83] international exhibit.

While developing this direction in research projects, we hope to fulfill the most important social order for our collective--to achieve overall automation of the process of planning and control of production, and manufacturing articles in industry. We have already set about implementing this task, by working out in conjunction with specialists from the Minsk Tractor Plant a system for automation of planning for future models of tractor-cultivators.

The promising models and methods which we have created for solving a wide category of tasks for optimizing design decisions utilizing electronic computers will help the designers to produce better quality results when creating new equipment. These projects were carried out under the leadership of V.S. Tanayev, doctor of physical and mathematical sciences.

A complex automation system for controlling the testing of various kinds of machinery and instruments was created by the collective headed by P.M. Chegolin, doctor of technical sciences.

Even the research projects which I have named testify to the practical direction of our work. In 1983, the economic effect from implementing the projects developed by the collective of the institute, the SKTB and experimental production, resulted in an 18,100,000 ruble contribution to the country's national economy.

[Question] Naturally these results mark a certain level, a certain kind of stage in the life of the scientific collective. What are the specific conditions like which provide for the combined work of all the subsidiary units? What have the institute's administrators, the party and social organizations done in order to achieve effective operations?

[Answer] Evidently it is more than anything the general positive atmosphere in the life of our society--the measures directed toward strengthening executive discipline and order; increasing one's responsibility for the results of one's labor; and adjusting the mechanism for quality work in all sections.

For ourselves, we have decided that each of our 1,300 associates--scientists, engineers, and production workers--must clearly understand the specific tasks for the day, for the month and for the year. In order to concentrate our efforts, the most important, purposeful directions for research were defined. And this defines the "character" of our institute, and its contribution to the development of science.

Perfecting the system of socialist competition has given us a great deal. In our opinion, the most important aspect of competition within our scientific collective should be the criteria for quality in the work carried out, and its creative character. Contests have helped a great deal; contests for the best idea, for the best invention, for the most effective introduction to production, and so on. Success was promoted by establishing a creative atmosphere and a climate of scientific quest in the laboratories, and by the intensive and effective work of the experimental design subsections.

On the eve of a magnificent date in the life of the Belorussian people, the 40th anniversary of the liberation from the German fascist usurpers, the veterans of the Great Patriotic War, veterans of labor, and those who stood at the cradle during the birth of the institute nearly 20 years ago, have turned to their comrades at work and to the young people in the collective with the following appeal: "Each person at his place of work must become an example of discipline, organizational ability and the highest degree of responsibility for the matter entrusted to him."

The summons of the senior workers generated commentary among all the associates in the collective. They are preparing to greet the glorious jubilee with specific deeds and achievements in labor, to successfully complete the assignments of the five-year plan.

9006

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## STUDY OF YOUNG PEOPLE'S LABOR ATTITUDES DISCUSSED

Moscow KOMSOMOL'SKAYA PRAVDA in Russian 15 Apr 84 p 2

[Interview with Professor Vladimir Aleksandrovich Yadov, doctor of philosophical sciences, professor, by KOMSOMOL'SKAYA PRAVDA correspondent I. Pestun, Leningrad: "Man and the Economy: Masters of Their Destiny"; date of interview not given]

[Text] Comprehensive sociological studies were conducted in Leningrad in one and the same enterprises with a 15-year interruption. One of the topics studied was labor in the set of a young person's moral values. For a sociologist 15 years is a substantial time period. Just what changed? What are they like, today's young people, from the standpoint of science? This was the subject of a discussion by our correspondent with Doctor of Philosophical Sciences, Professor V. A. Yadov.

[Question] Vladimir Aleksandrovich, let's imagine that you now are a shop chief in a major enterprise. You have on your desk a pile of petitions for release at the person's own desire written by young workers. It is no secret that one hears that today's young people allegedly do not work as we did... Do you, a shop chief, share these opinions?

[Answer] No, I don't, either as a "chief" or as a scientist.

I remember in the late 1950's when I worked as secretary of one of the Kom-somol raykoms in Leningrad, that a very acute question arose to the effect that the older postwar generation, which experienced all the hardships, was trying to "compensate" as it were for these deprivations by creating hothouse conditions for children and teenagers. I recall the journal articles of these years, articles about softies and idlers.

Today's young generation is no worse than my own. Is the problem of indoctrination more acute? I don't know, I don't know... Development of an attitude toward labor always has been a very important issue of socialism's indoctrination policy. Only its inner emphasis changes. So that today's shop chief is no better or no worse than "yesterday's."

[Question] But still, would you sign these petitions or set about to dissuade and convince?

[Answer] Above all I would begin thinking about what motives are prompting the young workers' acts.

Science indicates that today's generation is distinguished by greater rationalism and practicism, so to speak. Is this always bad?

There are trends which are objectively inevitable and deep in substance. It is senseless to "fight" them. Let's take that same rationalism. A young rationalist's position is as follows: I will work well if you create conditions for me: if the machine tool is in order, if there are no mistakes in the technical and operational data certificate, and if the production engineers have not confused anything; i.e., those conditions under which each person neatly performs his duties, where it is not necessary to "patch up holes" or recheck one's neighbor.

The first wise rule of indoctrination is not to go at cross purposes with some trend. To the contrary, it must be used to the maximum for the work. The young people's high exactingness toward production organization is in fact to the favor of production itself.

[Question] Could you tell in more detail about comprehensive studies performed among the Leningrad workers?

[Answer] First about the quantitative changes which occurred in the 15 years. It is no longer single percentages, but a third of those surveyed who have begun to have separate apartments. The proportion of young production workers with a secondary education has risen from 22 to 62 percent. Wages rose an average of 76 rubles. But other trends also were discovered. The turnover of cadres among workers engaged in unskilled and manual labor rose. On the one hand, a great attraction toward innovation was discovered and, on the other, discipline has become weaker.

When the first study was made young workers entering an independent life adhered to the moral standard of "an improvement in matters is everyone's concern." Today young people coming into production have been brought up on the need to introduce NOT [scientific organization of labor] and ASUP [automated production management system] and on the idea of perfecting planning and labor incentives. Only a third of the young workers surveyed believes they are working at the limit of their capabilities. The others are sure that they could increase their output by 10, 20 and even 50 percent, and they give a very critical assessment of those troubles in production for which corresponding engineering and planning services are at fault.

On the other hand, the reaction of young people usually is positive if only even the promised minimum of conditions is provided. There is practically no personnel turnover among young workers at the Svetlana Association. It is not at all because the production there is too attractive; it is monotonous and

requires precise movements. It is simply that a unique social contract is concluded with each novice coming to Svetlana where the worker pledges to fulfill the norm, not violate discipline and not allow defects, and the administration pledges to provide all conditions he needs.

[Question] There are more and more "adjusted" productions, but eight out of ten Moscow schoolchildren are oriented toward universities.

[Answer] I believe the figures cited are typical of the situation of a very large capital city. Our information indicates that for the country as a whole the entry into universities has abated noticeably.

[Question] Vladimir Aleksandrovich, you mentioned those limits beyond which young workers see functions that are exclusively "someone else's." But what is to be done with the slogan "Be a proprietor of production!" which follows a person from the schoolbench to the threshold of the entrance gate?

[Answer] To feel responsibility one must have an opportunity to display it. I cannot be responsible if I myself do not make decisions or see their results. In order for the slogan to work it has to be filled with specific meaning each time.

In fact it is a question of the worker's interest in the success of his enterprise. Sociologists call this an identification problem. It is being studied actively abroad in particular. We know of a number of attempts to resolve it, such as placing a portion of the shares in the workers' hands. This is of course deception and fiction. But under our socialist system where form and content actually coincide we have to use this principle much more effectively. This is also mentioned in the USSR Law on Labor Collectives. In addition, we have public consumption funds and forms of material incentives.

But material incentive is not the chief path of identification if only because of the psychological aspects. We realize that we are quite far from planning in everyday life and as a rule do not keep "ledgers." And for now we take that "thirteenth" wage as "mad money." If we have it, that's good, but we generally don't apply any special effort to obtain it.

But the main reason is that in the present stage of society's development (when we are full, shod and dressed) the material factor itself gradually loses its leading role and our actions are guided more and more by something spiritual.

I'll give the following example. Studies were conducted repeatedly in the years of Soviet power into the reasons for lack of progress by schoolchildren. Well now, while almost 90 percent in a number of schools lagged because of poor nutrition and a lack of teachers in 1927, in 1972 90 percent "appeared" for quite different reasons. Progress was affected by the degree of attention to children's indoctrination, by parents' education, family cultural traditions and so on. As we see, the material factor ceased to be a leading factor in the sphere of studies.

What methods for elevating identification are most suitable for us? Without discounting material incentives, it is participation in management and above all in norm setting.

[Question] It was noted at the April 1984 CPSU CC Plenum that our young people have to begin independent life highly cultured, educated and industrious. The course set toward a general professional education in the school reform cannot help but inspire optimism, for the problem of eliminating not the consequences, but the reasons for late civic development is being solved on a global scale.

[Answer] The Basic Directions for Reform of the School of General Education and Vocational School discusses the fact that young people are to acquire a trade right after eighth grade. This is a very correct direction! Sixteen-year-olds have a natural need to work. Their familiarization with the real difficulties of production is a normal process and it generates no inner protest. A protest arises when the young people suddenly become idle due to shutdowns in production.

[Question] But still, Vladimir Aleksandrovich, let's return to that same pile of petitions with which our conversation began. Just what would you write on these petitions as a result, not as a shop chief but now as a sociologist?

[Answer] That this enterprise is not yet capable of shaping a genuinely socialist attitude toward labor to the proper extent. That addressing the youth here with references to the past will largely be fruitless since the enterprise itself obviously has lagged in organization of labor.

Human needs develop in the basic spheres of a person's life, and above all in the labor sphere. This is why "our enterprise" has to carry on creative work which would force the young people to draw themselves up, ponder the key factor in life and defend their position. To do this the young people will have to know more. This will have an inevitable and comprehensive effect on the life and work of the enterprise itself and all of us must work for the sake of this.

6904

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## BRIEFS

MICROPROCESSOR SYMPOSIUM IN TALLINN--Tallinn--The International Seminar on Problems of Microprocessor Technology conducted in Tallinn by the ESSR Academy of Sciences Institute of Cybernetics is one of many examples of fruitful cooperation between specialists working in the area of electronics. Simultaneously held here was an exhibit of electronic equipment presented by the Swiss firm Imoteks. Scientists and specialists from various cities of the country together with colleagues from Switzerland became familiar with the experience gained from, and future applications for microprocessor technology for solving problems in machine-planning, automated testing and control, and in other areas. The specialists gave high marks to the displayed models of peripheral equipment, and in particular to a new logical electronic analyzer which, in contrast to earlier models, not only identifies errors, but also explains why an error occurred. [By Yu. Kovaleva] [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Apr 84 p 3] 6289

COMPUTER ANALYSIS OF AUTO PARTS--A report on the results of a three-year joint project completed by scientists in the Laboratory for Carrier System Reliability at the BSSR Academy of Sciences Institute for Problems of Vehicle Reliability and Durability, together with research-designers at the Moscow Automobile Plant states that: "Work has been completed on an experimental computer-driven system, "Gidropul's" which, in accelerated testing unit operations, makes it possible on the basis of strength criteria to predict objectively the function of a future automobile's parts and units and design the housing for drive wheel axles and axle shafts of trailers." This is in reference to the manufacture of equipment and the design of methods for testing the strength, durability, and lifetime of basic parts for future automobile models. This would seem to be separate task in the course of making a new model. But if one converts that task to a series production scale, the "separateness" grows to gigantic proportions. If one considers the savings gained in metal and funds, the reduced testing time, and the reduction in the time required for vehicles to move from draft plans to the assembly line, the advantage is clear. "The experimental system is completely automated," explained A. A. Rakitskiy, Laboratory Chief of the Institute, candidate of technical sciences and M. I. Gorbatshevich, Deputy Chief of the Steering Mechanism Testing Section, Chief Designer of the Minsk Automobile Plant. "It is computer-driven, day and night. The system reproduces very precisely and "copies" typical traffic conditions and

speed, accounts for a driver's operation on the road (braking, turns, stops, etc), and even the degree of the driver's skill." "The operating parts of the automobile models MAZ-5335 and MAZ-6422 have been tested on the 'Gidropul's'," said Chief Designer of the Belavto-MAZ Association, doctor of technical sciences M. S. Vysotskiy. "This has made it possible to reduce by one half the weight of the housing for the rear drive axle, assured the reliability and durability of its operation, and has resulted in an annual savings of about one million rubles. There is one more important result of our cooperation with the scientists. A new scientific direction of research has been created at the Minsk Automobile Plant that is connected with the theory of predicting the reliability and durability of machines by using local test models and simulating actual operational conditions. [Text] [Minsk SOVETSKAYA BELORUSSIA in Russian 15 Apr 84 p 2] 6289

UKRAINIAN PLEDGE FOR HIGHER QUALITY PRODUCTION--Kiev--We, the scientists of the Ukraine, as does the entire Soviet people, wholeheartedly accept the thoughts expressed by General Secretary of the CPSU Central Committee comrade Yu. V. Andropov in his speech at the December plenum on the necessity of being constantly and persistently concerned with the acceleration of scientific-technical progress. Scientists of the republic are actively participating in the fulfillment of the Union-wide comprehensive target scientific technical programs: Six comprehensive republic programs on basic directions of scientific-technical progress are being effectively incorporated in our republic with the help of UkSSR Academy of Sciences specialists. The UkSSR Academy of Sciences Institute for Problems in Material Studies is a leader in our country in the comprehensive target programs associated with the development of powder metallurgy and composition materials. Through the incorporation of its own projects, the Institute as early as the beginning of the Five-Year Plan has guaranteed a savings of over 300 million rubles. We are now developing further cooperation with collectives of 300 organizations, 49 ministries and departments of the country. Our goal is to raise the technical level of production and product quality more quickly. [By Vice-President of the UkSSR Academy of Sciences V. Trefilov] [Text] [Moscow PRAVDA in Russian 3 Jan 85 p 1] 6289

AUTOMATION PLANS FOR LENINGRAD REGION--Leningrad (TASS)--A meeting of the CPSU Obkom Council on Economic and Social Development and Acceleration of Scientific-Technical Progress took place at the Smolny Palace. An examination was made of progress being made in the drafting of the plan "Territorial-Industrial Programs for Intensifying the Development of the Leningrad National Economic Complex on the Basis of Automation and the Broad Utilization of Computer Technology for the Period up to 1990." The scientific supervisor of the program, Chairman of the Presidium of the USSR Academy of Sciences Leningrad Science Center Academician I. A. Glebov, presented a report. It was noted that the compilation of this document has been completed at the present time. Special attention in the program draft was given to the creation of flexible automatic plans, to problems of increasing the efficient use of automation in developing manufacturing process control systems, information processing systems in industry, municipal management, the agro-industrial complex, in construction, in the communications and

transportation sectors, in the area of scientific research and planning. In consideration of the large scientific-technical potential of the Leningrad economic region and the present amount of work being done on problems of production automation and management, it was deemed advisable to devise a system that would facilitate the thorough and continuous automation of all stages in the "research-production" cycle. Also addressing the meeting was First Secretary of the Leningrad Obkom, Chairman of the CPSU Obkom Council on Economic and Social Development and Acceleration of Scientific-Technical Progress L. N. Zaykov. Participating in the discussion of those problems were members of the CPSU Obkom Buro, secretaries of the Leningrad Gorkom, and members of the council presidium. [Text] [Leningrad LENINGRADSKAYA PRAVDA in Russian 21 Apr 84 p 3] 6289

NEW PHYSICS INSTITUTE IN TOMSK--A new academy institute has been created in Tomsk--the Institute for the Physics of Durability and Material Studies. At the request of 'KL', the Institute's director, USSR Academy of Sciences Corresponding Member V. Ye. Panin tells us about the Institute's tasks: Our institute was organized as an outgrowth of the Solid State Physics and Material Studies Department of the USSR Academy of Sciences Siberian Branch Institute of Atmospheric Optics. Its very creation is already indicative of the significance and pressing importance of the tasks set before us. Modern-day materials must be able to function under quite unusual conditions--at extreme temperatures, exposure to irradiation, corrosive media, and under impact loads. In many cases the lack of high-impact materials for operating under such conditions has impeded scientific-technical progress. Our goal is to produce highly efficient materials. In that connection a special place in our investigations will be taken up by such areas as the development of the physical fundamentals of powder metallurgy and the application of powder coats, the physics of durability, cold strength and abrasion resistance of materials, and the physico-chemical principles underlying the technology of producing new materials for working under the climatic conditions of Siberia and the North. [Text] [Moscow KOMSOMOL' SKAYA PRAVDA in Russian 15 Apr 84 p 4] 6289

PARAMETRIC AMPLIFIER DISCOVERED--Four discoveries made by Soviet scientists have been entered into the State Registry during the first three months of this year. Today 'KL' reports on one of them. The discovery's authors are a group of Moscow physicists under the supervision of USSR Academy of Sciences Corresponding Member V. V. Migulin: Pick up the telephone receiver and listen--You will hear a steady hum that is neither connected with your conversation nor with an equipment malfunction. That hum stems from the amplifier which is a device that enables you to receive words spoken from a very long distance. That hum is not such a serious matter in a telephone conversation, but if we would like to hear the "voice" of a distant star, such a hum would become a serious interference. The fact of the matter is that very weak signals are markedly distorted by the internal noises that occur in any amplifier. The associates of the Moscow State University Physics Department and the USSR Academy of Sciences Institute of Radio Engineering and Electronics have made a discovery in the field of wave physics. It offers new possibilities for improving amplifier equipment. The discovery has made it possible to eliminate resistance from the

instrument's circuit that is the basic cause of internal noise. The scientists used the so-called phenomenon of parametric energy enclosure in which a supplementary frequency specifically acts upon the primary signal so as to increase its intensity. This phenomenon was known earlier as well. But in order for the phenomenon to take place, it was necessary to adhere to a series of complex conditions that were not considered to be practicable. Moscow physicists discovered that under superconductivity conditions, the excitation of parametric oscillations is much easier to bring about. It is interesting that although this has been proved theoretically, it took several years to build an apparatus on which scientists could demonstrate the phenomenon they had discovered. The discovery made by Soviet physicists is of particular interest to radioastronomy and other branches of science that are concerned with very weak signals and a need for the utmost in improved apparatus. [By O. Utesheva] [Text] [Moscow KOMSOMOL'SKAYA PRAVDA in Russian 15 Apr 84 p 4] 6289

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